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Ans'd

ANNUAL REPORT

OF THE

CHIEF SIGNAL OFFICER

OF THE ARMY

TO

THE SECRETARY OF WAR

FOR

THE YEAR 1889.

930920

IN TWO PARTS.

PART I.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1890.

REPORT OF THE CHIEF SIGNAL OFFICER.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, September 30, 1889.

The Honorable REDFIELD PROCTOR,
Secretary of War:

SIR: I have the honor to submit, for the fiscal year ending June 30, 1889, the regular annual report of the operations of the Signal Corps.

DIVISION OF MILITARY SIGNALING.

In the performance of the strictly military duties which by law devolve upon him, the Chief Signal Officer of the Army has found himself seriously embarrassed by an utter lack of facilities for using or caring for the field telegraph trains or other signal equipments under his charge; for the practical training and drilling of the officers and enlisted men of the Signal Corps, and lastly, but to a minor extent as compared with the foregoing conditions, by the need of liberal appropriations. It goes without saying that under such conditions the officers and men of this Service are gradually but surely retrograding as regards their military duties. No matter how able and industrious the officer, nor how perfect his theories as to the principles and applications of communicating intelligence from a distance, yet experience and practice are the only safe criterions of efficiency. The existing condition of affairs in connection with military signaling is set forth with considerable fullness and detail in the admirable report (Appendix No. 1) of 1st Lieutenant Richard E. Thompson, 6th Infantry, Signal Officer, who during the past year has had charge of the Military Signaling Division.

Lieutenant Thompson is fully familiar with the general principles and details relative to foreign organizations and signal appliances, but with all his interest and pride in the work of our Army, he is obliged to admit that our system for the operation and maintenance of lines of communication in active service is only a theory. The report describes clearly and succinctly the existing condition of the field telegraph trains of the American Army; refers briefly to balloons for military purposes; carefully discusses the subject of improvement of field-glasses for general army use; dwells on the results of experimental studies for the perfection of the field telephone kit, and on the kind and proportion of cables necessary for use either with telephone equipments or in connection with light field lines, and sets forth in considerable detail the existing conditions of foreign armies as regards these indispensable auxiliaries to military operations. The insufficiency of present signal supplies, whether for current use and practice through out the Army, or as necessary adjuncts to the system of coast fortifications under way, is pointed out. The part of Lieutenant Thompson's report which dwells on instruction and practice at military posts is an unpleasant emphasizing of the unfortunate condition into which military signaling has fallen. When the year's practice of the whole Army can be set forth in detail within the limits of a single manuscript page, and when it becomes necessary, for lack of material, to dwell in an annual report upon the fact that it is possible for officers and men of the Army to communicate with each other at a distance of seven or eight miles, no more cogent argument than this fact is needed to emphasize the necessity of improvement and change in current methods of signal instruction and practice.

It appears somewhat remarkable at this period, when the highest talents and most acute minds are applying themselves in civil life to the development and extension of motors and methods for speedy and increased communication—whether bodily by railway lines or mentally through the process of telegraphy and telephony—that the practical conclusion should be reached in the American Army, that work of kindred and closely allied character could be performed by the ordidary officer or enlisted man without the mediation of a competent expert as instructor. Such indeed, neither more nor less, was the result of General Orders No. 109, A. G. O., series of 1885, which took from this office the authority devolving upon it by law and intrusted its duties to the good will and shifts of line officers and men already heavy laden with other labors.

The present Chief Signal Officer has not failed in the past to set forth, as was his duty, his strong convictions upon this system. As pertinent to this subject he reproduces from his annual reports of 1887–'88 extracts, in which were clearly set forth the results certain to follow from such a system:

> It appears evident from the record of this and past years that, instead of the Army being properly and efficiently drilled in military signaling, there is not an average of an officer to a regiment who is competent to transmit signals—by sun, flag, and torch—day and night, except those who have passed through a regular course of instruction in direct connection with this office.
>
> The Chief Signal Officer hazards nothing in saying that this condition of affairs—where a lack of sufficient training and skill in most instructors is supplemented by an evident want of interest in the Army at large—must result in the constant deterioration of the efficiency of instruction in military signaling throughout the Army. The only remedy for this is to be found in the detail of an officer of the Signal Corps with a small number (say four or six) of men, as instructor at the great schools of the Army, at Fort Leavenworth, Fort Monroe, and Fort Riley. One officer of the Signal Corps would be sufficient to give this instruction, as he could be quartered at the school where the largest number of officers were stationed, and could perform his duties of instruction at the other

schools at such periods of the year as would least interfere with special duties. In order that the efficiency of officers at large should be tested from time to time, an officer of the Signal Corps should be detailed to visit the larger posts of the Army for the purpose of inspection and examination as to the condition and efficiency of military signaling.

While the retention in service of men well skilled in military signaling enables the Chief Signal Officer to now meet any ordinary demands made upon him, yet it is evident that, unless drill in military signaling be carefully kept up under charge of officers peculiarly interested in the Service, two or three years will find the entire Army without a party in it properly skilled in the use of modern appliances. The maintenance of signal drill as at present throughout the Army, while subserving a most useful purpose in forming a body of partly skilled men who, under the care and drill of an experienced officer, could soon be fitted for any service, can by no means be considered a proper substitute for a small but thoroughly efficient signal corps.

The officers of the Signal Corps themselves are now deprived of all the means of regular instruction and drill and will soon become unfitted for practical work under difficult conditions. A few years since the Signal Corps of our Army was the most efficient in the world, but now, while foreign governments, impressed with the importance of such service, increase and improve means of signaling, this Service must steadily retrograde unless suitable means of practice are provided.

The deterioration of army military signaling then forecast has steadily increased, and at the end of the fiscal year the condition of signal instruction in the Army is at the lowest ebb it has ever known.

The records show that less than one officer out of nine of the line of the Army has received instruction in signaling during the year; less than one in twenty-two averaged one hour's instruction monthly, even including the most elementary branches. One-tenth of the officers instructed had no field practice, and less than one-fifth of the whole had night practice, while only eleven officers of the Army, or far less than one per centum, have been drilled with flag, torch, and heliograph. Under orders there should have been regular monthly instruction at one hundred and thirteen posts; seventy have neglected instruction one or more months; seventeen, six or more months, and at four posts no instruction has been had during the year. There are no less than eleven regiments in which no officer has received instruction during the year, seven other regiments in which one officer, only, has been instructed, and four regiments in which two have had instruction. It thus appears that in over one-quarter of the regiments of the Army no instruction has taken place, and in over one-half practically none. General interest in signaling was manifested in but one regiment, the First Artillery.

Under such conditions one of two courses should be pursued, either instruction in the art of military signaling should be abandoned and the Signal Corps abolished or ample moral and material support should be given its chief so as to raise it to a high standard of efficiency, to keep it abreast of modern progress and invention, and to diffuse a practical knowledge of distant communication throughout our Army. The telegraph, the heliograph, the electric flash light, and the telephone have become potent factors in civilized warfare, and the continued neglect of a military corps which is charged with their study, practice, and operation, cannot commend itself to any prudent or thoughtful citizen. It would seem irony, were it not true, that while millions of dollars are being spent for the fortifications of our defenceless coasts, such conditions are allowed to exist in the Army that the Signal Corps cannot furnish needful telephones, telegraph lines, or other electrical apparatus for heavy artillery practice, nor can the garrison furnish skilled signal parties able to intelligently communicate under all conditions with adjacent garrisons or with co-operating squadrons.

The Major-General commanding the Army has not only shown a decided interest in the military work of this Corps, but he appreciates its just and important value as an indispensable adjunct to modern armies. He expressed in his last annual report the necessity for a small and well-organized Signal Corps, and following his recommendation the military committees of both houses of Congress favorably reported a bill for such reorganization. It is evident that whatever civil duties may be imposed upon him, it is first of all the duty of the Chief Signal Officer to see that proper methods of inculcating a knowledge of signaling, whether by electricity, heliograph, or other device, are properly fostered and carried out in the Army. Pending legislative action, and with a view of raising the standard of efficiency and instruction from its present low ebb, the Chief Signal Officer has urged upon the Commanding General the importance and necessity of a reorganization in the methods of instruction throughout the Army. As has been shown above, instruction has devolved for several years upon officers who are imperfectly or entirely uninstructed, who depend for their knowledge upon crude and antiquated text-books now in use, and whose time is already absorbed by ordinary garrison duties.

There are a number of surplus officers in the Signal Corps whose special talents and abilities are not entirely suited to such scientific work as is intimately connected with meteorological research; as commissioned officers of the Signal Corps they should be utilized in performing their proper military duties. The utilization of the regular officers of the Corps, in connection with the instruction courses followed in the special Army schools of application, would tend to remove the merited reproach that the American system for the operation and maintenance of military lines of communication is only a theory. Practice with lines and field-telegraph trains can be had without considerable expense to the Government in connection with the summer camps of the regular Army, and particularly with the large camps of the militia in the various states. At present the greater part of the quite indifferent equipage pertaining to the field telegraph trains of this Corps is stored at Washington barracks, rusting and deteriorating through lack of use. As Lieutenant Thompson tersely says, the Signal Corps possesses the shadow, rather than the substance, of a field equipment.

It is evident that if the Army fails in qualifying itself for work of this technical character, yet, as long as the present interest exists in the militia, there will at least be a body of highly intelligent men to be called upon, who will have perfected themselves as far as is possible with their methods and instruction. Rarely a month passes without some communication from the militia showing their appreciation of the importance which attaches to means of distant communication, without which separated columns cannot successfully co-operate. Special attention to this important subject has been given by the militia of New York, whose excellent attainments in works of distant communication have been previously mentioned. California, Colorado, District of Columbia, and Massachusetts have also shown diligence and intelligence in signal work, while in several other States such organizations are in their incipiency or are projected.

In connection with the gathering of information as to appliances and methods of signaling in foreign countries, this office has incidentally gathered other information bearing indirectly upon other military subjects useful to the officers of a corps which, charged with the collection and transmission of useful information in the field in time of war, naturally should include in its duties in time of peace the kindred functions of a bureau of military information.

METEOROLOGICAL WORK.

The civil duties imposed upon the Honorable Secretary of War by Joint Resolution of February 9, 1870, and which have devolved upon the Chief Signal Officer of the Army, are of such an extended and important character as to practically absorb the attention and time of the greater part of the Signal Corps. Apart from the weather forecasts, in which the general public are concerned, these duties involve by specific legislation the issuing of storm-warnings and the display on the northern lakes, the Gulf, and sea coast of signals for the benefit of maritime interests; the gauging and reporting of rivers, in low water for the use of shippers and navigators, and in high water for flood-warnings; the maintenance and operation of sea-coast lines for the benefit of commerce and navigation, and of interior military lines for the use of the Army; the reporting of temperature and rainfall conditions for the cotton interests; the display of frost-warnings in the interest of agriculture, and the notification of advancing cold-waves for the benefit of the general public.

WEATHER FORECASTS AND STORM WARNINGS.

The issue of these warnings has been uninterrupted throughout the year, and such promptness and regularity has only been possible through the continuity and efficiency of telegraph service on the part of the Western Union Telegraph Company.

The increased demands for weather forecasts clearly indicate the value placed on them by the general public, which is beginning to appreciate that the variety of weather conditions in the large areas necessarily predicted for are such as to forbid for an entire state anything but forecasts of a general character. As a rule it is not practical in predictions to consider other than geographical divisions, but whenever the physical configurations of a state are such as to frequently produce contrasting weather conditions in different parts, the state is divided.

Applications asking special predictions for cities and towns have been so numerous that the already overworked Forecast Official cannot furnish such regularly. The office has, however, always furnished special and local predictions on occasions of public importance.

The impossibility of accomplishing additional work of this character is shown by the fact that the average time at the disposal of the Forecast Official for the discussion and formal issue of weather forecasts is forty-nine minutes in the morning and fifteen minutes more at night. In this limited time of forty-nine minutes, in addition to drawing duplicate sets of isobars and isotherms covering the United States, Canada, and the Northwest Territory, he prepares forecasts for three elements—weather, wind, and temperature—covering forty-one separate states and districts; studies the wind conditions relative to the display of signals at seventy-seven central stations and districts; considers possible frosts with reference to tobacco, sugar, cranberry, fruit, and vegetable regions, sending necessary warnings to thirty-three different addresses; notifies twelve parties of the approach of "northers;" and sends notices of approaching storms to nine other addresses. In addition he is obliged to proof and check the printed forecasts, to prepare a synopsis of the weather conditions for the previous twenty-four hours, and issue special bulletins for the press, in which shall appear essential and important weather characteristics. Until the present year he has also been obliged to watch and study the reports from twenty-four river stations on eight different rivers, forecast rises at low stages of water and predict floods in high stages, and also was obliged to consider the contingencies of approaching cold-waves with reference to one hundred and four stations and to send cold-wave warnings to twenty-four other separate addresses. The changes made within the past year have, however, relieved the Forecast Official of this latter work pertaining to floods and cold waves.

The above-mentioned duties devolve strictly and personally upon the Forecast Official, and in no event is he permitted to delegate these duties. Assuming that each of the separate duties requires the same time, the officer has only eleven seconds in which to decide, formulate, and express himself regarding any meteorological element of a district, such as weather, temperature, and wind. Hence it follows that on an average barely half a minute can be devoted to all the predictions for any particular state or district.

The Forecast Division has been strengthened during the year by the return to duty with this Bureau of Captain James Allen, 3d Cavalry, Signal Officer, whose wide experience and successful work in past years must inure to the continued improvement of this most important work.

Appendix No. 2 shows very briefly the work done in the Forecast Division during the year, and to it is appended a statement showing the duties of the Forecast Official.

In Appendix No. 25 will be found, as appropriate and pertinent to the work of this Service, a list of errata furnished by Professor William Ferrel, and supplementary to his paper, "Recent Advances in Meteorology," published as Appendix 71 to the Annual Report of the Chief Signal Officer of 1885.

The local press in the great cities of the country, and occasionally in smaller places, has appreciated the public interest in local forecasts, and has, in a number of cases, employed a meteorological editor, who, furnished with the data of the Signal Service, has enlarged on the general synopses of this Bureau, and supplemented them by definite and satisfactory local forecasts. These meteorological editors of ability have put forth their forecasts not only in an agreeable form, but, thoroughly familiar with local needs, in such shape as local business interests demanded. The value of such supplementary work cannot be overestimated, since millions of readers of these great metropolitan dailies never see the regular data issued by this Service. Among the many great journals which so largely contributed climatological and meteorological data of local interest, may be particularly mentioned the "Boston Globe," "Boston Herald," "Cincinnati Commercial-Gazette," "Chicago Tribune," "Detroit Journal," Galveston News," "New York Herald," "New York Tribune," "San Francisco Chronicle," and the "Saint Louis Globe-Democrat."

The predictions from Blue Hill Observatory, temporarily discontinued, have been renewed through the liberality of Mr. A. L. Rotch. These forecasts, confined to Boston and vicinity, have been valuable supplements to the forecasts of this office, which apply to the whole state of Massachusetts and necessarily deal with more varied and frequently contrasting weather conditions.

Weather forecasts have been issued daily, at 8 a. m. and 8 p. m., for a period of twenty-four hours. The examination of these forecasts has been in the hands of Assistant Professor Charles F. Marvin, whose report forms Appendix No. 3. As stated in the last annual report, the passing upon these predictions rests on an official free from prejudice or bias, a mental condition which was almost impossible under the old system, where officers engaged in the forecast work verified the correctness of the work done by other officers, who in turn were judges of their accuracy.

The percentages of successful forecasts, as set forth in detail in Professor Marvin's report, are for weather, 84.4; temperature, 75.8, with a general average of 81.0. During the year 1,066 storm signals of all kinds have been ordered, of which 680 have been wholly, and 74 partly, justified as to velocity, and 980 justified as to direction.

Each official of this Service has been given full credit for the forecasting work done by him, his name appearing in the Monthly Weather Review, with percentages of successful work as regards the prediction of weather, the display of storm signals, and cold-wave warnings. In Appendix 3 will be found the yearly summary, wherein appears the relative standing of each official, both in detail and for the year.

The present system of signals, adopted two years since, is most advantageous and satisfactory, as it gives clear and definite information. By the use of two flags and two pennants the general public are informed whether the storm is to be light or severe, whether its centre is approaching or has finally passed the station, and from what quarter high winds are expected. The yellow cautionary signals indicate winds which it is believed will be dangerous to light craft or illy-provided vessels, while the red storm flag indicates the more dangerous and violent gales.

2d Lieutenant J. E. Maxfield, Signal Corps, has continued in charge of weather forecasts for the Pacific coast, with headquarters at San Francisco. The predictions have been issued twice each day at 8 a. m. and 8 p. m., except during August, when that officer was absent inspecting stations.

The excellent results arising from continued practice is shown by the very decided improvement in the percentages of successful predictions since Lieutenant Maxfield has assumed charge. The per centum has risen steadily from 78.3 in 1887 to 81.6 in 1888, and 83.8 in 1889.

HURRICANE REPORTS.

The Chief Signal Officer is gratified to report that the weather reports from the West Indies have been, in a measure, resumed, through the courtesy and energy of Mr. Louis E. Carbonelly, Director of the Naval Observatory at Havana, Cuba. These reports are of inestimable value during the cyclone season, and from 1874 to 1881 six stations (Barbadoes, Guadelupe, Havana, Kingston, Santiago de Cuba, and Saint Thomas) were maintained at a very considerable expense to this Service. In 1881, they were discontinued, partly through the failure of appropriations and partly owing to doubt being thrown upon the legality of spending any part of the appropriations in maintaining a station outside the limits of the United States.

The loss of these stations has been very much felt, and several of the most violent and destructive hurricanes which have ever devastated the United States coast have arrived unannounced, simply from lack of detailed meteorological information from the West Indian stations. Several efforts to secure special appropriations for the maintenance of these stations have met with failure.

In January this office was informed that the Spanish government had placed its meteorological service under the Navy, and under the direct supervision of the director of the Naval Observatory at Havana, and that the service would be inaugurated about January 15th. The Chief Signal Officer promptly informed the director that the prospect of the establishment of a West Indian meteorological service under the control of the Spanish government was highly gratifying, and tendered the full co-operation of the Signal Service in exchange for such reports as would be mutually advantageous to the commerce of the United States and of the West Indies.

The organization of the Spanish-Cuban meteorological service has been carried forward with great energy on the part of those officials charged with its management, and the results already attained give assurances of inestimable benefits to commerce through systematic and accurate information of existing atmospheric conditions in the West Indies and on the South Atlantic and Gulf coasts.

During June, arrangements were made by the Chief Signal Officer and Mr. Carbonelly, the director, for sending daily, by cable from Havana to Key West, reports of observations taken at Havana, Santiago de Cuba, Jamaica, Puerto Rico, Santa Cruz, Antigua, and Barbadoes, and for sending from Key West to Havana daily reports of observations taken at Charleston, Galveston, Key West, and New York City.

A plan has been devised by which Mr. Carbonelly will also be informed of the location and character of any marked atmospheric disturbance in that section of the United States south of the 40th parallel of latitude and east of the 97th meridian of longitude.

As Mr. Carbonelly is obliged to depend upon voluntary reports and the courtesy of the telegraph company, it follows that this service has been somewhat irregular, and that reports frequently fail at most critical periods. To the present time reports south of Cuba have not been furnished, to the great detriment of the public. In lieu of any special appropriation for this work this service will be continued under the present system of exchange, from which valuable results, though not the most valuable, cannot fail to flow.

COLD WAVES.

The system of forecasting the sudden changes of temperature known as cold waves and of indicating, by flags, their anticipated approach, is not only valued highly by the general public during the winter months, but is frequently of great advantage to agricultural and other interests in connection with the first killing frosts of autumn and the last freezing spells of early spring. Great as are the benefits to be derived by the agriculturist from accurate forecasts of this character, yet they can hardly be greater than are the advantages to manifold business interests in the great centres of population, where the comfort of thousands is affected, and the health, possibly the lives, of hundreds, are endangered by sharp and unexpected falls of temperature against which provision has not been made.

The Chief Signal Officer initiated last year the plan of intrusting the forecasting of cold waves to a single officer, believing that success in any special branch could be best attained by continued studious application and uninterrupted practical work. 1st Lieutenant Thomas M. Woodruff, 5th Infantry, Acting Signal Officer, was selected for this duty, and, as was set forth in the last annual report, the percentage of successful signals ordered by Lieutenant Woodruff was greater than that of the preceding year. The exigencies of the service caused the relief of this officer from duty in the Signal Service, so that the entire work again devolved upon the Forecast Official of the central office. In this contingency the Chief Signal Officer was obliged to select a successor to Lieutenant Woodruff, with a view to such assignment being permanent.

Assistant Professor Thomas Russell was directed to investigate and study this class of phenomena, and at the earliest moment practicable (December 1, 1888) he was assigned to the work of forecasting cold waves. Professor Russell was at considerable disadvantage in this work, first, from lack of practice, which, however, in a service of this kind must be made largely at the expense of the general public; second, from restrictions the present Chief Signal Officer had placed around predictions of this character, which, it is believed, were, in former years, treated and verified with too great a leniency for public interests; and, third, from the fact that cold-wave signals are now required from many stations in the extreme west, where in former years they were not displayed, whereby, as cold waves appear first in the west and generally move eastward, the percentage of successful forecasts must necessarily diminish by the extension of display stations to the northwest frontier. In past years, also, it did not affect the percentage of an officer if he failed to forecast a coming cold wave, nor was there any limit placed upon the length of the display, so that in some cases cold waves had been considered as verified by the advance of a second wave after the failure of the one first predicted.

The work of Professor Russell, all things considered, has been most satisfactory, and, with the exception of the month of March, the percentage of successful forecasts increased steadily from his first month of forecasting in December to the last in April. Another very marked improvement is shown by the fact that during the past year less than 6 per cent. of cold waves occurred east of the Mississippi and 12 per cent. west without the display of signals, while in former years over 40 per cent. of these cold waves occurred without forecasts.

As was pointed out in the last annual report, it was necessary in the interest of the public to take into account cold waves which advance unannounced, since the system of percentages, as before calculated and published, was such as to encourage neglect of warnings in difficult cases, and, by confining forecasts to the most plainly defined waves, thus obtain an apparently higher percentage of success. In addition to revising the system of prediction and the methods of verifying them, the Chief Signal Officer has also directed an examination into the workings of the system of cold waves, concerning which there has been more or less complaint, owing to a misapprehension on the part of the general public as to the exact meaning of the term "cold wave." In former years this term implied that the temperature would fall abnormally during the coming twenty-four hours 15° or more, and that it would reach a minimum of 45° or less. The Chief Signal Officer has changed this in the direction demanded by the public press, so that in the northwestern districts the temperature must cause killing frosts and in other portions of the country must induce light frosts. Further investigations are now being made, and during the coming winter this Service will adopt a sliding scale for the minimum temperature which must be obtained to make the display a success. Since unsheltered instruments in exposed places fall from 10° to 15° lower than those in Signal Service shelters, it is evident that a temperature of 40° indicates frost. Such weather conditions are severe and damaging at any time in the Gulf and south Atlantic states, although this temperature would be a mild one in midwinter in the Ohio Valley, while in the extreme northwest the temperature for successive months always falls much lower every night.

Professor Russell's report on cold waves forms Appendix No. 12. It is a most interesting document, which not only sets forth generally the character and success of the work for the past year, but also fully and frankly discusses his failures. It points out the manner in which cold waves occur, outlines typical cases, and indicates the lines of research and investigation which will most thoroughly promote success in forecasting cold waves. The cause of these waves is briefly alluded to, and the Chief Signal Officer hazards little in expressing the opinion that during the coming year the country will be favored with more satisfactory predictions of this class than ever before.

WEATHER SIGNALS.

The number of points supplied with telegraphic forecasts and warnings at Government expense was 1,056 at the end of the year; the observers continuing, as before, to furnish the flags, pay for the delivery of the telegrams and make the display of the signals without expense to this Service.

ATMOSPHERIC ELECTRICITY.

The systematic observations of atmospheric electricity which had been carried on for two or three years were finally discontinued on August 1, 1888. These observations have been under the supervision of Professor T. C. Mendenhall, formerly president of the Rose Polytechnic Institute, now at the head of the United States Coast and Geodetic Survey. The great personal interest taken by Professor Mendenhall in work of this character is well known. The Chief Signal Officer considered himself most fortunate in having the co-operation of so distinguished a scientist, whose connection with the work has consisted not alone in formulating the conditions and elaborating the instructions for these observations; he has also superintended their reduction, and after a careful study presented a full report of the work to the National Academy of Sciences, in whose proceedings, it is to be hoped, the detailed report will be published.

The more important conclusions reached in this investigation may be briefly presented:

The primary object of the work was to determine whether observations of atmospheric electricity could be made useful in weather forecasting. Early in the progress of the work the extremely local character of the phenomena exhibited became evident. It was found that instruments similar in every respect separated by a distance of a few hundred feet might give very dissimilar indications. The comparison of similar observations at five minute intervals, extending through several days, at the various stations failed to show any similarity of fluctuations or movement of electric disturbance from one part of the country to another, and the same conclusion must be drawn from the regular observations. It must be said, however, that the number of stations (at no time greater than six), distributed as they were over a wide extent of country, was too small to justify great confidence in this negative result.

The relations between the electrical conditions of the atmosphere and local weather conditions were carefully studied, with the hope that the results might afford assistance in the prediction of local storms, rain, snow, &c., which offer so much difficulty in forecasting by present methods. The well-known electrical activity during such storms was made the subject of special examination, attention being particularly given to the appearance of negative potential in connection with precipitation. The investigation only seemed to increase the range of meteorological conditions under which negative potential might be looked for and to diminish the definiteness of relation between it and precipitation. An examination of nearly one thousand cases showed that in about 53 per cent. negative electricity preceded precipitation, the time varying from a few minutes to more than ten hours, while in 47 per cent. no negative was observed. This result is in accord with the continuous photographic record at Baltimore when the latter alone is subjected to analysis. The examination of about two thousand cases from the record of the Kew observatory, covering a period of about eight years, gives a similar result.

In addition to the fact thus proved, that precipitation was not generally preceded by negative electricity, the observations showed that negative potential was many times recorded when there was absolutely no precipitation at the point of observation. In many cases, in fact, it was observed when the sky was perfectly clear. In a considerable number of instances it was found that precipitation had occurred within a radius of two hundred miles, but in many cases nothing of the kind took place, and it appears to be abundantly proved that negative electricity may be observed without being in any way related to precipitation, past, present, or future, and that it may be due to other causes, many of which are extremely local in their character.

Taking all the facts into consideration, it seems to be proved that the electrical phenomena of the atmosphere are generally local in their character. They do not promise, therefore, to be useful in weather forecasting, although a close distribution of a large number of observers over a comparatively small area would be useful in removing any doubts which may still exist as to this question. Unfortunately, the work requires observers of more than usual skill and intelligence, and the equipment of a station is somewhat expensive. The restrictions to which the work of this Service is necessarily subjected, forbid the further extension of an investigation which appears to promise so little in the way of practical returns.

REVIEW DIVISION.

The Monthly Weather Review has been regularly prepared and published during the year. It not only serves the legal purpose of putting the current observations in such shape as to enable the officials of this Service to preserve and discuss the meteorological data from month to month in connection with the current work of the Service, but it also answers as the means of acknowledging and preserving the observations of the volunteer meteorologists of the country, who receive no other return for their labors. The number of voluntary observers, whose meteorological work is thus preserved in this publication, is steadily on the increase, and the valuable co-operation of more than eight hundred new observers has been secured during the past year. As important practical results of these gratuitous contributions may be noted the more accurate representation of the climatic conditions over the entire country, especially as regards temperature and rainfall. Fortunately, a large proportion of these additional observers are situated in the trans-Mississippi country, and so in addition to their current value they subserve very largely the efforts now being made for the benefit of the arid regions of the West. As bearing on this question, this office has completed during the past year a series of charts which show for each month in the year the normal or average precipitation. These charts are deduced from observations of eighteen years, and while the short period during which rainfall observations have been made at many stations precludes the use of such data in these maps, yet it is believed that the charts show, in a fairly accurate way, the general features of the normal precipitation from month to month.

WEEKLY WEATHER CROP BULLETIN.

As pertaining to the Review Division, the Weather Crop Bulletin has been published by the same official. This bulletin, inaugurated by the present Chief Signal Officer in 1888, sets forth the effects of the weather from week to week upon the staple crops of the country. The bulletin was started as an experiment, and in its first year was received with great and continuing favor. With a view, however, of determining whether the favor of this publication was due to its novelty, the Chief Signal Officer decided to make inquiries as to its practical value before continuing it the present year as a permanent publication. The speedy and full replies from all sections of the country—from correspondents representing all the varied interests pertaining to the production and sale of staples, the largest dealers in the spring wheat regions of Minnesota and Dakota, the agricultural representatives of the central valleys, the tobacco dealers of Louisville, the rice and cotton dealers of the New Orleans Board of Trade—all dwelt upon the Weekly Weather Crop Bulletin as being of great benefit. Mr. James Gordon Bennett, of the "New York Herald," not only considered the Weather Crop Bulletin especially important to American dealers, merchants, and farmers, but also considered it of such interest to Europeans as to justify him in cabling the substance of it weekly to London and Paris.

The information contained in the bulletin has not only been of such interest to the general public as to cause the press associations to telegraph it regularly over the entire country for general publication, but as to create a demand for the full and exact text of the bulletin and the detailed data on which it is based, so that nearly 16,000 copies of the bulletin and about 10,000 copies of the detailed data have been issued during the year to boards of trade, exchanges, chambers of commerce, and the larger firms dealing in wheat, cotton, rice, tobacco, corn, and other products.

The bulletin sets forth the excesses and deficiencies of temperature, sunshine, and moisture for every section of the country during the seven days prior to its issue, and also since the beginning of the year. Whenever such remarkable and persistent conditions obtain over any particular section as appear likely to affect favorably or unfavorably any particular crop, these conditions are set forth not only for the preceding week, but for the preceding season or month, as the case may be. When on the evening of publication the weather conditions are such as to justify the editing official in the belief that the changes in the next twenty-four hours will materially alleviate or somewhat aggravate the situation, such opinion is also put forth. In this manner the dealer and the farmer are equally informed as to the existing or anticipated weather conditions, beneficial or injurious to the crop they are interested in.

The farmer or producer derives an advantage from knowing whether his crop is increasing in value or whether it is likely to depreciate, and in the case of several crops is able to determine to which one he may under existing conditions profitably and particularly apply himself. On the other hand, while the dealer possesses all information sufficient for legitimate uses, yet the fact that this information is scattered broadcast over the country weekly has a tendency to steady prices, and thus prevent rapid fluctuations in values which are so injurious to the best interests of the country. The effects of extensive natural injuries to crops, such as follow early and extensive killing frosts, floods, or widespread and long-continued storms may be, and often are, greatly exaggerated, so that anything is a public benefit which will circumscribe and keep within correct limits the reports of damage done. Such is undoubtedly the tendency of these bulletins, wherein appear exact data, setting forth not only current conditions, but also the relative departures from average conditions.

In order that the farmer and the dealer may stand on equal footing, and also so as to avoid any opportunity for premature publication in any special interest, the bulletin is prepared, given to the press, and mailed on Saturday after the close of business. The general bulletin is published in full by many of the Sunday metropolitan newspapers, and the detailed data by mail reaches by Monday morning cities as far distant as Atlanta, Saint Louis, and Chicago.

The marked success of this bulletin must be largely attributed to the able and intelligent labors of its editor, Captain H. H. C. Dunwoody, who has been in charge since its establishment. In addition to ripe experience gained in a long and successful career as a forecast official, Captain Dunwoody brings to this work a mind trained by previous investigations on the important inter-relations of crop-production and weather conditions.

INTERNATIONAL BULLETIN.

The work carried on in connection with the International Bulletin has been materially modified and reduced, owing to the discontinuance January 1, 1888, on the part of several countries of regular international simultaneous observations. This office has continued, however, as in the interest not only of the world in general but of the meteorological work of the United States, the task of tabulating and charting such meteorological data as are received from co-operating services and observers to show the monthly and annual mean pressure and wind force and direction. There have been prepared in this office charts showing from 1878 to 1887 the monthly and annual pressure, wind force and direction, the normal distribution of atmospheric pressure, and the normal and monthly barometric changes at stations which have co-operated with the United States during these years. Also, charts have been completed which show the number of cyclonic storms that have been traced through each square of 5° during the ten years in question, over which charts lines have been drawn indicating the most frequent direction of storms over the several countries and oceans of the Northern Hemisphere. These charts will be put forth for the benefit of the international co-operating observers, together with a small amount of text showing the general deductions drawn from these observations.

FOREIGN WEATHER SERVICES.

The arrangement authorized by the Honorable Secretary of War, under which the Chief Signal Officer was to co-operate with Professor Mascart, Director of the Central Météorological Office, Paris, France, has been regularly and faithfully carried out. Each night a cablegram is sent to Professor Mascart, at Paris, summarizing the synchronous meteorological observations, gales, derelicts, and dangerous ice of the western Atlantic for the previous five days, together with the current weather conditions of the United States. This information is highly appreciated by the Central Meteorological Office of France, which utilizes it for making its own forecasts, and is also valued by all shipmasters, who profit by early and detailed information as to fogs, ice-fields, and wrecks, whereby their westward courses from England and France may be made with greater safety and speed.

The Chief Signal Officer has pleasure in acknowledging the continued courtesy and hearty co-operation of the Hydrographer of the Navy, under whose orders valuable and supplementary ocean data have been daily and regularly furnished this Bureau. In this work credit is also due to the "New York Herald" ocean weather service for meteorological data regularly furnished.

STATE WEATHER SERVICES.

Captain H. H. C. Dunwoody, 4th Artillery, Signal Officer, has been charged throughout the year with the co-operating work of this Bureau in connection with the State Weather Services. This officer's long experience and great zeal in connection with these meteorological associations have been noted in previous annual reports. His current report forms Appendix No. 4.

The voluntary and co-operating organizations in the states of New York, Oregon, and Colorado have been placed upon a secure basis by legislative action, whereby state services have been regularly organized, with definite appropriations for their support. Including the separate states comprised within the scope of the New England Meteorological Society, there are thirty-one states receiving benefits resulting from such local organizations.

Supplementary to the ordinary state weather work, most of these state services issue a weekly bulletin which sets forth the effects upon crops produced by existing weather conditions as well as those of past months. The detailed report sets forth the benefits and advantages which, in the opinion of the directors, have accrued to their own states.

The Chief Signal Officer has continued towards these services a policy of liberal and hearty co-operation. The able administration and high scientific standing of the directors in charge of these services are matters of congratulation. They conduct the affairs of their own organizations after their own policy without intruded suggestions. State services which are only branches of the national system must be of limited utility. An independent and untrammelled policy, in accord with the demands of state and local interests, is essential to the highest order of success. The Chief Signal Officer refrains carefully from any effort to influence the line of work of these organizations, since he realizes that the state and national services work under differing conditions, on separate though nearly converging lines of research.

The substantial aid rendered to the local services by the detail of Signal Service observers as assistants to the directors has been recognized as one of the most important features of the co-operating work of this Bureau with the state services, as it brings to the aid of the directors men whose education and experience qualify them not only to render valuable assistance in selecting stations and instructing observers, but also to assist in tabulating and preparing the reports for publication.

There are at present twenty-six observers of this Bureau performing duty in connection with state services; and in selecting men for this important duty special endeavor has been made to furnish men of liberal education or college graduates of superior qualifications.

RIVERS AND FLOODS.

The Chief Signal Officer has initiated the policy of intrusting the river and flood service of this Bureau to the supervision and care of a single official, and the work of Professor Thomas Russell, in charge of the forecasts of cold waves, has been supplemented by the additional charge of the river and flood service. Prior to this year the responsibility for the care and maintenance of the river stations and the prediction of the stages of the water devolved upon three different divisions and as many officials. The concentration of the responsibility under one official has already inured to the benefit and advantage of this important work. Observations of the height of rivers are made at seventy places on twenty-six rivers. At the most important points these observations are made throughout the year, but at others only once a week, except during the flood months when they are daily telegraphed to this office and to section centres. These river stations are supplemented by forty-five rainfall stations, located near the headwaters of the important tributaries of the great rivers, from which points rainfalls of an inch or more in twenty-four hours are telegraphed to section centres.

Changing the river observation to 8 a. m. was determined on July 1, 1888, to give the general public information at as late an hour as possible. By this change the river observations for the entire country appear in the local evening press when only four to five hours old, while formerly the observations were taken at 2 p. m., too late for the evening papers, and only reached the country by the morning journals from sixteen to seventeen hours old. In addition to the regular 8 a. m. reading an additional reading at 5 p. m., daily, is furnished for the benefit of the morning papers.

The detailed report of Professor Russell, Appendix No. 13, shows the number of river and rainfall stations in operation, the centres to which they report, and other executive matters of importance.

As is set forth in the appendix, the appropriations available for carrying on the river observations are not only insufficient to maintain daily observations throughout the year at important stations, but are not even large enough to enable observations to be made for a portion of the year for the benefit of various communities along the Alabama, Cousa, Tallapoosa, Savannah, and Potomac rivers. While this office was enabled, on general and meteorological grounds, to forecast, from twelve to twenty-four hours in advance, the severe and destructive floods which occurred at the end of May, 1889, in Pennsylvania, Maryland, western New York, and West Virginia; yet had a complete river and flood service, supplemented by rainfall stations, been in operation, it would have resulted in more definite forecasts and consequent great benefit to the general public. While the value of property saved in Washington City, through warnings of this Bureau, was far greater than the annual appropriation for the entire flood service of the country, yet had money been available for the establishment of a proper gauge at Harper's Ferry and the maintenance of rainfall stations at Gettysburgh, Pa., and Woodstock, Va., this office would have forecast with much greater exactness the height of the coming flood, and thus been the means of saving a much larger amount.

In default of sufficient Government appropriation, the state of South Carolina has established the past year a number of river stations to be under control of its state weather service. It hardly seems equitable that the benefit of such service should be given to one state and denied another. In consequence the Chief Signal Officer has increased his estimate for this service to $13,000, which is only $3,000 above the amount allowed prior to the reduction forced upon this Service last year. The present service is also unsatisfactory in that the record at the greater number of stations is not continuous throughout the year, It requires several years' observations to determine the relation between the floods and the height along the various stages of the river.

In accordance with special instructions, and in order to improve and make more definite the forecasts of the stages of water in the several rivers, Professor Russell has investigated the inter-relation of river gauge readings, rainfall, and floods at various stations along the Mississippi and its principal tributaries. This investigation required a consideration of the rainfall over the entire watershed of the main river and its tributaries; the possible evaporation; the amount of water the saturated air could contain; the quantity of water which is held in the soil and given out as a perennial flow and that which drains into the sea. Fortunately rainfall observations, lately collated in this office, for past years were available for the study of these questions with reference to the Mississippi Valley for 1881-'82, during which years the river discharges at various points were measured under the direction of the Mississippi River Commission. The results of these investigations appear in Professor Russell's report (Appendix No. 14).

Apart from the current benefit derived from these studies, the data herein appearing will be of interest and value in other respects, as it cannot but have a pertinent and important bearing upon all projects for the prevention or mitigation of floods and other important points, so that the paper is of more than passing value and interest. The fact that the upper and middle Missouri valleys, comprising all the drainage basin above Omaha, during the great Mississippi flood in March, April, and May, 1882, furnished for each valley only one per centum of the water flowing out at the same time from the lower Mississippi River controverts opinions which, if not generally accepted, are certainly very widespread. This is also emphasized by the fact that the great Missouri flood of 1881 did not flood the Mississippi.

INSPECTION OF STATIONS.

Including the inspections late in June, 1888, there are but few stations of this Service which have not been inspected during the fiscal year. The necessity and importance of careful inspections have been dwelt upon in previous reports. In no other way can the Chief Signal Officer be informed of the misconduct of the small percentage of men of the Corps who fall into evil habits and consequent neglect of their public duties and to the local discredit of the Service. Inspectors also supplement the efforts of the observers in increasing the sphere of usefulness of this Service to local interests. Appendix No. 8 gives the date on which, and by whom, the various stations have been inspected during the year.

UNITED STATES TELEGRAPH LINES.

The cable at Tatoosh Island which connected, telegraphically, Cape Flattery with the mainland of Washington Territory, has been interrupted almost the entire year, having failed on December 10, 1888. The estimate of $6,300 for its repair was unfavorably considered by Congress, and steps have been taken looking to the abandonment of the entire line from Tatoosh Island to Port Angeles. This line was of great importance to the maritime interest of the Pacific coast, since every vessel entering or leaving Puget Sound rounds Cape Flattery, from which point their arrival or departure could be reported for the benefit of the maritime exchange of the Pacific coast.

On June 30, 1889, 621 miles of sea-coast telegraph lines were in operation, namely:

	Miles.
From Titusville to Point Jupiter, Fla	130
From Wilmington to Southport, N. C	30
From Norfolk to Cape Charles, Va., and to Hatteras, N. C., *via* Cape Henry, Va	176
From Narragansett Pier to Block Island, R. I	29
From Wood's Holl to Nantucket, Mass	98
From Astoria, Oregon, to Fort Canby, Wash	28
From Port Angeles to Cape Flattery, Wash	80
From San Francisco to Point Reyes, Cal	50

The Chief Signal Officer deems it important to again clearly set forth (as shown in detail by his letter of September 24, 1888, transmitting estimates to Congress) that over one hundred thousand dollars of the appropriations of this Service are expended for the maintenance, repair, and operation of sea-coast and military telegraph lines, which are of slight and only incidental value to the general weather system of the country. Attention has already been called to the fact that the military lines are maintained as valuable and economical adjuncts to the Army in maintaining a feeling of security among the inhabitants of the western frontiers, and in preventing or repressing Indian outbreaks. The sea-coast lines, in addition to the reporting of vessels, frequently render service of inestimable value in summoning assistance in cases of maritime disasters. While rendering these great services, yet even the sea-coast lines cannot be considered as part of the general weather service. The expenses of these lines are in no way chargeable as part of the appropriations for the weather service.

2d Lieutenant William D. Wright, Signal Corps, in charge of the sea-coast lines on the Atlantic seaboard, has kept his land lines and cables in excellent working order during the year and through careful supervision has done his work at a minimum expense.

2d Lieutenant James A. Swift, Signal Corps, has satisfactorily managed the telegraph lines in Oregon and Washington Territory.

2d Lieutenant William A. Glassford, Signal Corps, has been in charge of the difficult telegraph lines in Arizona and New Mexico, except during a short leave, when he was replaced by 2d Lieutenant Frederick R. Day, Signal Corps. In addition to the satisfactory management of his telegraph work, Lieutenant Glassford has laudably and zealously devoted available leisure to professional researches. He has made a study of the meteorological conditions and partly formulated the climatic factors of Arizona, especially with reference to irrigation. Lieutenant Glassford's exertions have increased the number of voluntary meteorological observers in Arizona at remote and isolated points where climatic data were totally wanting.

2d Lieutenant Frank W. Ellis, Signal Corps, in addition to the satisfactory management of his own lines in Texas and the Indian Territory, has also been in charge for the greater part of the year, during the disability of 2d Lieutenant B. M. Purssell, Signal Corps, of the lines in Montana, Dakota, Wyoming, and Utah.

There were in operation on June 30, 1889, 1,615 miles of military telegraph lines, with sixty-four telegraph or telephone offices, a decrease of 290 miles during the year. This decrease results from the abandonment and sales of such telegraph lines as are unnecessary for military purposes. The policy has been invariably followed of recommending the abandonment and sale of these lines as rapidly as the construction of commercial lines will permit.

The entire receipts from all telegraph lines, military and sea-coast. during the past fiscal year, aggregate $7,177.70. These moneys, together with those arising from the sales of abandoned lines, have been deposited in the United States Treasury, as required by law.

CORRESPONDENCE DIVISION.

The report upon the enormous volume of correspondence which pertains to the Service, exclusive of property and money letters, is set forth in Appendix No. 8. As parts of this appendix, appear a list of stations inspected during the year; of stations recommended for occupancy, and of meteorological committees which have been in communication with this Bureau during the year.

Nearly 300,000 communications have been received, and about 100,000 sent, excluding bulletins, weather maps, &c., distributed by the Publications Division.

Much needed reforms have been inaugurated in the methods of correspondence, and the present system is simple, inexpensive, and expeditious. The amount of labor saved under the present methods, as compared with those in use several years since, may be inferred from the fact that the same amount of correspondence now recorded by one clerk engaged the time of four under the old system. In addition to the improvement in the methods of entering and disposing of this correspondence, its easy examination is insured by the concentration of all the letters received since the organization of the Bureau in a central depository, where nearly 700,000 communications are now systematically filed. This arrangement facilitates the dispatch of current public business and insures the perfect custody of these papers.

Attention is again invited to the fact that this Bureau has not sufficient space for the preservation of all the records which the law requires to be preserved. This results from the enormous number and extensive bulk of many obsolete forms and valueless papers which have accumulated during the past twenty years. These worthless papers have, indeed, been dignified by the name of records, although the greater part of them contain data which, when once noted, immediately become useless. Not only do these papers take up office space otherwise needed, but their bulk prevents the proper arrangement of other valuable records, thus uselessly consuming valuable time of the clerks engaged in searching for and compiling meteorological data.

As far as the current business of the office would permit, the indexing of the war records of the Signal Corps has been thoroughly and systematically pursued. Whenever possible the time of the clerks is now occupied in making a complete transcript of the military history of every officer and man who served in the Signal Corps during the war of the rebellion. There are about 2,300 such cases, and of these over one-third have been taken up and about one-tenth completed. In order to avoid the utter destruction of the rolls and returns the work is being systematically done, so that each of the thousands of papers involved need be handled but twice. It is hoped that this important work will be completed during the coming fiscal year. The war records are already so methodically arranged that requests for information in pensions and other claims are invariably completed and returned to the Adjutant General within one working day.

The Chief Signal Officer has special pleasure in commending the zeal, attentiveness, and fidelity of the clerks and employés in the central office. But one case of tardiness and two cases of inattention to duty have been reported during the year, and these on the part of employés who have since left the Bureau. It is not believed that there is a clerk or employé in the central office who does not give full and complete service during every day of attendance.

The record of absence of employés at the central office is such as would be creditable to any service. The average absence, with pay, aggregates for each person a fraction less than thirty days, 24.6 days with leave, and 5.2 on account of sickness. As appears from the detailed statement, the male employés have been absent, for all reasons, twenty-nine days on an average, the female employés thirty-six and a half days.

STATIONS DIVISION.

The executive charge of the meteorological stations throughout the country has remained during the year in the hands of 2d Lieutenant James Mitchell, Signal Corps, whose intimate knowledge of the personnel of the Service and full and practical experience in its details have not only maintained the previous efficiency and standing of this division, but has also resulted in improved and simpler methods, so that a larger amount of station work has been done than ever before and without an increase in the number of the force.

In the Stations Officer's report, Appendix No. 9, are data setting forth the change in the number and character of stations and other important details of the general service throughout the country. The only stations of importance opened during the year have been Harrisburg, Kansas City, Manistee, Parkersburgh, and Wichita, Kansas; all of which stations were of importance for the general meteorological system of the country, except Kansas City, which is but a few miles from the station at Leavenworth. Kansas City was necessary, not only for the dissemination of meteorological information through charts and bulletins, but also for the local interests of so great and important a city. Frequently new stations are urged upon this Bureau, but the establishment of an increased number is impossible without a corresponding increase in the appropriations. The general meteorological needs of the country are sufficiently subserved. Doubtless a better rearrangement for the general good of the country is possible, and whenever any changes are made the policy is followed of conforming to that arrangement which would work the greatest good to the greatest number. Occasionally, as at Baltimore, Erie, Kansas City, New Haven, and Sandusky, the local interests to be subserved by the work of this Service are so important as to justify the exceptional establishment and maintenance of offices.

Until the past year there was only one first-class meteorological station* under control of the Chief Signal Officer. At this date there are five such signal stations in the United States, and within a year the number will be increased to thirty.

Five hundred stations were in operation on the 30th day of June. Of these 149 are meteorological stations taking two or more observations daily; 32 auxiliary meteorological stations taking a daily observation; 23 repair stations on United States military-telegraph lines; 66 special wind-display stations; 72 special river stations; 44 special rainfall stations, and 114 special cotton-region stations.

The observations have been continued at 114 special stations in the cotton-region for the period between May 1st and November 1st—the season during which temperature and rainfall conditions materially affect the cotton crop. By this means all interested in this important crop can follow it from the planting to maturity.

At the special wind-display stations storm signals are displayed for the benefit of commerce by paid agents of this Service. Frequent demands are received for new stations, but the present number cannot be increased without a corresponding increase in the sub-appropriation for this purpose.

The Chief Signal Officer, in disseminating the detailed meteorological information collected by this Bureau, has endeavored to keep abreast with the demands, and this has been barely possible by introducing in the Service the most improved methods of duplication. In distributing meteorological information, the weather map, now published at about forty of the larger stations, has been found to be the only form which gives general satisfaction. It presents the weather reports in a simple and graphic manner, which is easily understood, and which, from its form, permits speedy comprehension and favors speedy utilization of its data by business men having interests affected by the weather. A more liberal and extended policy than has before prevailed is now in operation, whereby the daily weather maps for 8 a. m. and 8 p. m. are furnished and posted at the post office in every prominent town that can be reached within a reasonable time from Boston, Cincinnati, Kansas City, New York City, Saint Louis, Philadelphia, Chicago, and other points so selected as to afford speedy postal communication with adjacent towns.

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*A first-class station is one where the most important meteorological phenomena are continuously registered by means of self-recording instruments.

The success of this scheme of dissemination depends very largely on the facility of transportation and accuracy of handling by postal authority. The thanks of this Bureau are due to the Postmaster General for the postal facilities extended to this publication, which, by order, is handled and treated as first-class matter.

In addition to the maps displayed in post-offices, these charts are distributed gratuitously to boards of trade, chambers of commerce, and other large business or public corporations; and also, when needed for study and instruction, to the teachers in the high schools of the country. The demands for public use are so great that only in rare and exceptional cases is it possible to issue these maps gratuitously; although applications by hundreds are made for them. The demands for charts of this kind have increased wonderfully, despite the fact that their distribution is limited, as stated above. The total issue of maps in the fiscal year ending June 30, 1887, was 178,248 copies; for 1888, 392,161 copies; and in 1889 it has risen to 859,000 copies; the number having nearly quintupled in two years.

It is gratifying to be able to report that the condition of the meteorological stations throughout the country, as regards office furniture and general accommodations, is better than ever before. The appropriations for the maintenance of these stations now obviate the necessity of menial service and petty deprivation which for a number of years harrassed and annoyed observers, whose interest and spirit in connection with their legitimate duties have doubtless improved with the advent of respectable surroundings and proper facilities for work. Every effort has been made to create a laudable interest and spirit of emulation among the observers by encouraging suggestions for increasing the practical usefulness of the Service. Observers are encouraged to make climatic and meteorological investigations, and to write upon scientific subjects pertaining to the work of the Corps, and in cases where a memoir has been prepared which could not be published by this Bureau, permission is invariably accorded for its publication on the author's responsibility.

Forms and reports have been simplified and reduced in number, while all data and observations which do not have some direct and important end in view have been discontinued. The observers now, through such a course and with their offices furnished with one or more self-registering instruments, are able to devote the greater part of their time to a consideration and study of the local interests which can be subserved by meteorological information and how best such work can be done, and finally to give considerate attention and exact information to such of the general public as can be benefited.

During the year a system of special observations and reports was instituted whereby the observer was authorized on the occurrence of sudden and violent changes in atmospheric conditions to telegraph such facts to this office, so as to keep the Forecast Official fully informed as to the existence and nature of such meteorological phenomena. The confidence thus intrusted in the observers has been justified by the result; since it has rarely happened that any first class observer of the Service has used the telegraph without there being excellent reason for his action. The Chief Signal Officer has also initiated instructions looking to higher and wider action on the part of local observers, who until this time have been strictly forbidden to forecast the weather or to express their opinions as to coming changes. The demand for local forecasts is very general, and it appears unreasonable to debar the public from the benefit of the judgment of the local observer, who, if he has an intelligent interest in his station duties, cannot fail to have a decided opinion as to the character of coming weather. The authority confided to make local forecasts, now for the first time intrusted to observers, will first cover the weather for the coming twenty-four hours, and later, if the success of the observer justifies it, directions will be given to forecast temperature and other atmospheric conditions. The confiding of these important duties to the observers demands more than ever judicious care in the recruitment of the Service and in the promotion and assignment of its non-commissioned officers.

The high standing of recruits, whether mental, moral, or physical, is insured by all possible precautions. Not only are the candidates subjected to a rigid physical examination, which the law imposes upon every recruit for the Army, but they are obliged to furnish favorable recommendations as to their moral standing and general character. These recommendations are obtained as far as possible from well known persons, but, unfortunately, the experience of the Corps shows that many of these indorsements are given on insufficient knowledge of the character of the applicant. As a further guarantee, the Service insists upon a rigid written examination, which is confined to such ordinary branches of English education as bear directly and pertinently upon the prospective duties of the candidates. Yet, notwithstanding the fact that the mental examination is a simple and practical one, fifty per centum of the candidates fail and are rejected. In spite of the great care taken in recruiting the Corps, it not infrequently happens that for the good of the Service, principally on account of drunkenness, indebtedness, or repeated neglect of duty, it becomes necessary to recommend the summary discharge of enlisted members of the Corps. During the past year sixteen such discharges have been recommended. As a rule the unworthiness of a man develops early in his service, and since men are not re-enlisted unless their standing is good, discharges of re-enlisted men are becoming rarer.

Enlisted men of the Corps have been absent from duty on account of sickness less than three days to each man; and absent from duty with authority nine days for each man. In view of the fact that the work of this Service necessarily demands the presence of its observers every day in the year, including Sundays and holidays, it will be noted that they work more days than any other class of Government or private employés in the country.

The intellectual and moral standing of the enlisted men of the Signal Corps have never been higher than at present. Excluding the men enlisted for special duties, such as repairmen, printers, &c., no less than 36 per centum of the entire Corps are men who are graduates or undergraduates of colleges. Nor is the Corps devoid of men who have had training in other branches of the Service; for there are no less than sixty-one men, or 20 per cent. of the entire Corps, who have previously served in the volunteer or regular Army.

Apart from the one hundred and one men whose standing was changed from enlisted to civil employment under act approved October 2, 1888, there have been sixty-one discharged from and re-enlisted in the Signal Corps; one retired; two lost by death; twenty-six discharged at their own request, and sixteen for the benefit of the Service.

The general satisfaction of the enlisted men with the Service is shown by the fact that over 54 per centum of the entire Corps are men who are serving in the second, third, or fourth enlistment; while during the past fiscal year there were no men who did not re-enlist at the expiration of their term of service, excluding three whose re-enlistment was declined as not advisable in the interests of the Service.

The average length of service of enlisted men of the Signal Corps, June 30, 1889, exclusive of those who had enlisted during the year, was nearly nine and a half years. As this includes two hundred and ninety-three men, it shows that as regards permanency and fixed tenure of office, the Bureau compares favorably with any other of equal size under the Government.

In recognition of the faithful services rendered by the highly educated and efficient men of the Signal Corps, and in accordance with the spirit and letter of the law providing that surplus vacancies in the grade of second lieutenants in the Army shall be filled from competent enlisted men, the Chief Signal Officer has selected two sergeants distinguished for moral standing, high character, and marked executive ability, whose names will be presented as fitting representatives for such promotion.

INSTRUMENT DIVISION.

In co-ordinating the work of the central office it became evident that all matters relating to the control and maintenance of the supply of instruments at the various stations, as well as instructions bearing upon the correctness of instrumental observations, should be brought under one head. Formerly the details of exposure and supplying of meteorological instruments pertained in part to several divisions, and the routine methods necessary in carrying on this work seriously interfered with speedy and accurate action, while the divided responsibility impaired the efficiency of the Service. It was fortunate for the Chief Signal Officer that Assistant Professor Charles F. Marvin, an official particularly suited by his mental qualities and inclinations for this special class of work, was available for this duty, to which he was assigned in the early part of the present calendar year. The regular current work of the Instrument Division has been seriously interfered with, and for nearly two months was almost entirely suspended, owing to two removals of the central office. The last removal was not without its advantages, since it necessitated an entire rearrangement of the self-recording instruments at the central office, and eventually their condition must be much more satisfactory than before obtained.

An important result which flows from the supervision of the station instruments by one person, relates to maintaining the equipment of all meteorological stations at the highest standard of excellence. Formerly this assistant depended upon another division for information as to signs of deterioration in station instruments; now it is his own duty to particularly observe the performance of and replace all instruments not only before an interruption of the current record occurs, but at such time as to leave unquestioned the accuracy of the past observations.

The advantage of continuous records of wind, temperature, rain, sunshine, and pressure, by automatic or other methods, has been fully recognized. Self-registering anemometers have long been in use in this Service, but now special attention is given to the invention, improvement, and introduction, as rapidly as possible, of other self-registering instruments, both for current use and in order to secure continuous data for future study and reference. Such instruments, as soon as they are tested and compared, are distributed in accordance with a general plan which recognizes that such uninterrupted records are of the greatest value in the large cities. After such stations are equipped the remaining instruments will be so distributed as to insure the covering of the whole country with a net-work of self-registers. Forty self-recording thermographs are now in working order at selected stations; while arrangements are being made for the distribution of the same number of triple registers, whereon are recorded at the same time the direction and velocity of the wind, as well as the rainfall. The atmospheric conditions of the large cities, where dust, smoke, and acids obtain in the air to a marked extent, affect deleteriously all meteorological instruments, especially delicate thermographs, which, exposed in instrument shelters, are necessarily subjected not only to these influences, but to all sorts of weather. The instruments in large cities require overhauling every six or eight months, and while in the past such action has often resulted in prolonged interruptions of the record, arrangements are now made whereby extra self-registering instruments will be available at the central office, and thus obviate the loss of record or reduce it to a minimum.

While experience has shown that the thermographs of Richard Fréres, of Paris, are the most accurate and reliable in their performance as regards temperature values, yet the efficiency of these instruments is considerably impaired by their unsatisfactory watch-movements, which are undoubtedly inferior to the American-made mechanisms. The foreign-made movement can be replaced by a home-made one, but the French thermographs, protected by an American patent, must be used as a whole until American ingenuity, as it undoubtedly will, supplies a better one. The self-registered records of pressure and temperature, to secure accuracy, are checked by semi-daily eye-readings of mercurial instruments. Through a simple device, by the use of a graphical correction card, invented in the Instrument Division, these readings are readily reduced to the standard of the mercurial instrument without the tedious labor of calculating and interpolating hourly corrections.

A number of special thermographs of the Richard construction have been obtained, which are intended to register electrically at a distance the temperature of the air. The extreme complexity of these instruments forbids their use except in skilled hands, and even then their continued satisfactory performance appears doubtful.

Impressed with the importance of recording the rapidity of the rainfall as a problem intimately connected with sewerage, and so, with the welfare, comfort, and health of the great centres of population, the Chief Signal Officer has had pleasure not only in compiling, recording, and publishing all past data upon this subject, but also in arranging, as requested by the American Society of Engineers, for the future record of such important information. In view of the intimate relations of rainfall and wind, it was finally decided that the rainfall data should be recorded on the same sheet with the direction and velocity of the wind. The preparation of the registers and other devices for these observations has been delayed through the delinquency and tardiness of contractors, but eleven gauges are now in satisfactory working order, and it is hoped during the current year to increase the number to thirty or thirty-five.

The Chief Signal Officer has to acknowledge the courtesy of the Postmaster General in transporting safely for this Service the thermometers, barometers, self-registers, and other fragile instruments issued to the observers of this Service. Despite the utmost care on the part of skilled and trained men in shipping these instruments, it was found that their delicate and fragile character was such that when transmitted by express a large proportion of them were broken or injured. Owing to the detailed instructions from the Superintendent of the Railway Postal Service and the care of the railway clerks, these shipments are now made with great safety and breakages rarely occur.

The work of comparing thermometers and other instruments, brought to a high degree of accuracy by Assistant Professor Thomas Russell, has been continued throughout the year as required. Permanent provision has been made for such work in the new quarters, where the general improvements and appliances are such that future comparisons will be made with greater facility and accuracy than was before possible.

Lack of force and space has compelled the Chief Signal Officer to decline to compare thermometers or barometers with the standards of this Service, except in special cases, such as for other departments of the Government, or for scientific observers interested in special investigations. It is believed, however, that it should be a part of the work of the Service to compare either gratuitously, or for a nominal sum, all meteorological instruments which may be presented for such purpose.

It is intended during the current year to arrange, in the instrument room of the central office, such devices as may give to visitors a general idea of the class of instruments and other apparatus in the possession of the Bureau. Such an arrangement, in a convenient order, would be a practical illustration of recognized methods and typical meteorological instruments, which would serve not only for cursory examination by the interested public, but also for detailed study by special students interested in such apparatus.

With a view to insure the ultimate thermometer standards of the Service, they are carefully preserved in a fire-proof vault in the War Department building, and only working sub-standards are kept at hand in this office. It is to be regretted that while the so-called barometric standard of the Service (the Fortin, by Adie,) is an excellent instrument, yet it possesses none of the peculiar qualifications essential to standard instruments of great and permanent accuracy. It is hoped, however, that the office will soon be in possession of a standard barometer worthy of so extended and important a Service.

The large amount of executive work which has devolved upon Professor Marvin has prevented him from carrying out the instructions which look to one-third of his time being given to experimental study and investigation, but it is hoped that the pressure of executive work will soon be relieved, thus enabling him to apply himself to the higher and broader fields of scientific investigation for which he is qualified. He has, however, applied himself, as far as his arduous duties would permit, to experimental work in connection with triple registers, self-recording rain-gauges, sunshine recorders, and other special and new instruments, wherein entered work largely experimental in its character. Such work and such a variety of questions have required close theoretical consideration and study, as well as numerous physical experiments.

This office co-operated as fully as circumstances would permit with the very valuable and extensive loan exhibition of meteorological instruments and apparatus made under the auspices of the New England Meteorological Society, and in a few other cases has also made small exhibits in this country.

In order that this office might benefit by a more intimate knowledge of self-registering apparatus, and other labor-saving devices, Professor Marvin spent a few days at the Loan Exhibition of the New England Meteorological Society. He inspected the valuable apparatus of Professor Draper's observatory in Central Park, New York, and also the Blue Hill observatory, through the courtesy of Mr. A. Lawrence Rotch, at whose expense this well-equipped observatory is maintained. At both these observatories many of the best forms of meteorological instruments are maintained in continuous operation, and in more than one important respect this office has profited by this inspection.

Other questions of study and improvement are set forth in Professor Marvin's report (Appendix No. 11), wherefrom it appears that he is fully aware of the importance of the work devolving upon him, and is imbued with the intention of keeping himself abreast with the current of investigation and invention.

THE LIBRARY.

The library now contains over 11,000 volumes, exclusive of several thousand pamphlets, and is increasing nearly a thousand volumes a year, very largely by gift and exchange, as funds have not been available even for important meteorological works. The policy of confining purchases to strictly technical works has been rigidly pursued.

Unfortunately, the conditions under which many of the volumes are stored must result in rapid deterioration, unless they are properly arranged under other conditions. No provision of any kind was made by the last Congress for library shelving or furniture, but it is trusted that the coming Congress will make the needful appropriations. The value of any reference library is greatly enhanced by the arrangement of its volumes in such manner as to render them easily accessible and to insure their proper care and preservation.

The general bibliography of meteorology, which as completed up to January 1, 1882, contained about 50,000 independent titles, has been supplemented, as far as possible by Mr. Fassig and his assistant, from works and articles lately published. In order that the most important parts for current work should be available for reference, such titles as bear on temperature have been type-written in lithographic ink, and a limited number of copies have been lithographed therefrom. As opportunity allows, a similar course will be followed regarding precipitation. The great practical value of this bibliography has been dwelt on in previous annual reports, and the Chief Signal Officer again renews his recommendation that it be published by authority of Congress, at a cost not exceeding $10,000.

EXAMINER'S DIVISION.

This division has been for the greater part of the year under the charge of 2d Lieutenant Frank Greene, Signal Corps, whose report forms Appendix No. 6. The importance of the Examiner's Division has been enhanced under the provisions of the act of Congress approved October 12, 1888; in accordance with which, under regulations approved by the Secretary of War, November 1, 1888, the returns of signal property of every description from officers and enlisted men, and other Government officials, devolve on this division for final examination. Previously the receipt for public property given by an enlisted man or civilian employé was not considered as a legal and valid quittance, but under this act all officials connected with the Signal Service are directly and personally responsible for such property as they may receive. This latter condition of affairs, which conforms to sound business principles, relieves the Disbursing Officer of the Signal Service from the remarkable anomaly of personal responsibility for all property connected with the Signal Corps, whether in Maine or in Arizona—Alaska or Florida.

In addition to finally adjudicating property accountability, this division also examines and transmits to the auditors of the Treasury Department all money accounts pertaining to the Signal Service, including those for moneys received as tolls for transmission over U. S. military telegraph lines.

This enlargement of the scope of the duties of the Examiner's Division has naturally increased the amount of work to a considerable extent, which, however, to a certain degree has been counterbalanced by reforms in the business methods of the division. The work is as nearly up as its character will admit, and any temporary accumulation of work will be disposed of by the temporary transfer of a clerk from some other division of the office.

RECORDS DIVISION.

The Records Division has remained during the year under the charge of 2d Lieutenant John P. Finley, Signal Corps, who devoted himself to his duties with marked zeal and assiduity. The extent and value of this work can only be estimated by a perusal of the detailed report in Appendix No. 5.

The classification and rearrangement of past records has been materially impeded, owing to the change of office quarters, and unfortunately must suffer somewhat even in the new quarters because of lack of proper facilities for systematic disposition of the records. Notwithstanding these drawbacks great progress has been made in compiling, indexing, and arranging the enormous mass of meteorological data on file in this office. For the first time the meteorological data used in Signal Service work are scrutinized and examined, so that it rarely happens that doubtful data ever are allowed to have weight, either in current practical work or in the discussion of meteorological questions. Over 100,000 forms and reports have been systematically arranged, indexed, and bound in 1,009 volumes during the year.

The demands upon this office for meteorological information are rapidly increasing, not only in the number of the reports but in the extent of the data asked for. The central office has furnished 391 transcripts, covering statements used as evidence in court, miscellaneous tables for publication, discussion, or research, meteorological data for use in connection with commercial enterprises, and for the benefit of medical and other professional men.

Whenever current work will permit, preparation continues of the card index of all stations of the United States from which meteorological reports have ever been received. Cards for 2,714 stations have already been commenced, of which about one-tenth are wholly completed. When finished these indexes will afford an accurate and comprehensive history of all the climatic observations ever made in the United States. For current use two large index maps have been devised, upon one of which is entered, with appropriate devices according to the character of the stations, all the "live" stations—that is, those from which reports are now received—while the second map represents the "dead" stations, from which reports some time in the past have been rendered this office. The live map now shows, as two extremes, the condition of stations in New England, with one to every three hundred and seventy-six square miles, and in the territory west of the Mississippi River, where there is one station to four thousand five hundred square miles.

The following are the most important compilations which have been made by this division in addition to the preparation of current data for discussion and publication:

First. Special report made on September 6, 1888, for use in the House of Representatives, on the effect of impounding the rain and snow fall in reservoirs in the mountains near the sources of the Arkansas and Missouri rivers, and on other points relating to the interdependence or relations of the Mississippi floods to the precipitation of the Rocky Mountain region. This subject was illustrated by a series of charts and tables.

Second. Twenty-four charts of rainfall for the years 1881 and 1882; for use in connection with the discussion of flood forecasts for the Mississippi and its tributaries.

Third. Climatic data, charts, and tables relating to Oregon and Washington; published under Senate resolution of July 26, 1888. This chart shows the records of sixty-one stations in Oregon and Washington, and when completed consisted of thirty-eight quarto pages and eight charts.

Fourth. Senate Executive Document No. 91, 50th Congress, 1st session; The Rainfall of the Pacific Slope and Western States and Territories, covering data from six hundred and sixty-one stations, and consisting in printed form of one hundred and one quarto pages and fifteen charts.

Unless the data of this office had been put in systematic condition through the Records Division, the speedy preparation of these publications would have simply been impossible.

The Chief Signal Officer acknowledges the valuable co-operation of the Medical Department of the United States Army, which has furnished regular reports from an average of ninety-five stations—military posts in isolated and sparsely-settled regions where meteorological data is most desired. It may be added that the meteorological registers now received through the Medical Department of the Army show a greater degree of care and a higher degree of accuracy than has ever before been obtained.

The compilation and verification of monthly mean temperatures and monthly precipitation has been continued. Data of this character is now arranged by stations and states, and is permanently bound in 133 volumes, which contain nearly three-quarters of a million months of records.

Assistant Professor Henry A. Hazen, attached to this division, in addition to his work as Forecast Official, is charged with the data relative to the elevation of Signal Service stations throughout the country, and with the preparation of normal tables of temperature and pressure for current use in connection with the Service. In addition he has prepared various important tables bearing upon meteorological work, and has also been charged with the examination, discussion, and report of many vexed meteorological questions referred to this office for information and decision. A detailed statement of his work appears in Appendix No. 5.

Appendix No. 5 is the general report of the officer in charge of the Records Division, and Appendices Nos. 16 to 24 comprise such tables, compiled in the Records Division, as pertain to public business in connection with the Signal Corps and are necessary in current work. These tables are valuable and indispensable adjuncts to the preparation and study of forecasts, and also greatly facilitate the work of the office in supplying to hundreds of applicants valuable data which otherwise could not be furnished.

PUBLICATIONS DIVISION.

The technical preparation and the distribution of the publications of this office have been under the efficient charge of 2d Lieutenant F. M. M. Beall, Signal Corps, during the past year. Under Lieutenant Beall's supervision, important improvements have been introduced which facilitate greatly the printing and publication of the meteorological data in the shape of lithographic maps and bulletins. A detailed report setting forth the character of the work done and the methods followed in the preparation and distribution of the publications of this Bureau is to be found in Appendix No. 10.

On July 1, 1888, a radical change was made in the way and time of printing the daily weather charts. Instead of writing out the several data and sending them to the printer, the compositors are located in the Forecast Room and furnished with logotypes of all the data used on the charts. As the reports are translated for the Forecast-Room clerks, and as the changes are called off, the printers set up the data in type and symbols for the chart. After some practice no difficulty is experienced by the compositors in keeping up with this necessarily rapid dictation. By this process the charts are printed within twenty-five minutes after the last report has been translated, and are in the mail fifteen minutes later. Such reports as are not received in time to go on a current chart are printed in tabular form on the next succeeding chart, with a descriptive heading. By this means the series of the semi-daily charts are completed and issued at once. These charts contain nearly all the data available, and form a satisfactory meteorological record both for current use and future study.

DISBURSING DIVISION.

The disbursements for purchases and services connected with the Service were most zealously and faithfully made by Captain Francis B. Jones, A. Q. M., until that most efficient officer was assigned to duty elsewhere on March 1, 1889. Fortunately for this Bureau, his successor, Captain Robert Craig, A. Q. M., whose report forms Appendix No. 7, is an officer especially qualified for his new duties, not only by practical familiarity with his special duties, but by that intimate knowledge of the Service without which the care and responsibility ot the Chief Signal Officer would be largely increased.

Notwithstanding the interruption in current work, caused by the removal of the office to new quarters and also by the additional labor entailed by the transfer of property from the old to the new Disbursing

Officer, the clerical force of this division has been reduced by five during the year. Such a reduction was possible through co-ordination of work and the introduction of much-needed reform in methods of public business. The satisfactory state and prompt settlement of the money affairs of this Service is illustrated by the fact that out of 11,320 accounts growing out of the disbursement of the various appropriations during the year, there remained on June 30, 1889, only 89 unsettled bills, being less than eight-tenths of one per centum. Most of these unpaid accounts accumulated during June, and in all they involved less than three days' work.

In the Disbursing Officer's report will be found a list of contracts made during the fiscal year, submitted in accordance with the act of Congress approved April 21, 1808; also the condition of appropriations, with expenditures, balances, and probable demands, submitted as required by act of Congress approved May 20, 1820.

There has been deposited in the Treasury, as required by law, $133.55 received from the sale of 273 miles of abandoned telegraph line, and also the sum of $367.03 received from the sales of publications, under act of Congress, approved May 30, 1874, section 227, Revised Statutes, which latter sum accrued to the credit of the appropriations for observation and report of storms.

One of the most gratifying results of the year has been the complete and definite settlement of the suspended accounts of various disbursing officers of this Bureau (Captain S. M. Mills, 5th Artillery, Captain Francis B. Jones, A. Q. M., and 1st Lieutenant Robert Craig, 4th Artillery). These suspensions amounted to the sum of over $900,000 and the entire amount has been allowed. These accounts were suspended almost entirely under technical rulings. One set of accounts was three times audited, having been twice re-opened for no assigned cause. This suspension has finally resulted in a definite set of regulations being drawn up for the accounts of this Service and approved by the Second Comptroller of the Treasury, so that for the first time in the history of the Corps the disbursing officer and auditing officer know definitely the legal forms and requirements. No suspensions have been made since the succession of the present Chief Signal Officer.

Among the reforms which at the end of the present fiscal year will go into operation under the Disbursing Officer is that authorized by a provision in the appropriation act approved March 2, 1889, whereby it is directed that the pay and allowances of the enlisted men of the Signal Corps shall be disbursed by one check. This legislation corrects the evil which prevailed so many years in the payment to the Signal Corps, whereby for each man in the Corps three separate checks with three sets of duplicate vouchers were necessary every month, and such payments were made by three different officers, and in instalments, a method which enormously increased the labor and records and often delayed the final payment for weeks after the month ended.

The new method reduces the labor and records by eighty per centum, and insures immediate payment—an especially important consideration to men of small salaries. While the first payment under the new system did not fall within the fiscal year now under consideration, yet it seems proper to say that for the first time in the history of the Signal Corps the monthly compensation of the men was mailed to them on the last day of the month for which the pay was due.

Payments to all the men of the Corps wherever serving, whether in Arizona or New York, is now made by check, and it is worthy of note, as indicating the security of the method, that in the past five years 47,836 checks have been mailed to the men of this Corps and only fourteen have miscarried.

SCIENTIFIC RESEARCH.

To Professor Cleveland Abbe, as the assistant of the longest experience, and as a member of the National Academy of Sciences, was intrusted the important duty of preparing a popular and non-mathematical exposition of the laws of storms, with a view to their better prediction, and, in connection with a study of their diurnal variations, to constitute a deductive method of storm predictions. As set forth in the last Annual Report, Professor Abbe had this work outlined and in an incomplete state, but it is now finished and appears as Appendix No. 15.

This report entitled "Preparatory Studies for Deductive Methods in Storm and Weather Predictions," brings together many new results, together with principles and conclusions formulated by Professor Abbe since the publication in 1859 of the memoir by Ferrel, that is recognized as the beginning of modern dynamic meteorology. After stating what forces and resistances are important and which are negligible, he explains in some detail the term "friction," the prominent features of vortex motion, the turbulent flow of the atmosphere, and the dynamic origin of the diurnal variation of the barometer connected therewith. Much space is devoted to the vertical motion due to buoyancy, to the formation of the clouds, and to the conclusions to be drawn from their study. He finds the source and maintaining power of a storm in the absorption by the cloud of solar heat and in the liberation of heat in the cloud by those cloud particles that subsequently fall to the ground as rain or snow, and endeavors to show that the movement of the storm centre is principally influenced by the location and amount of such precipitation.

In this method one begins with a chart showing the current meteorological condition, and the permanent orographic features of the continent; lines of equal density are to be drawn for planes at several elevations above sea-level. On these latter, and on the lines of the orographic resistance, are based intermediate lines of flow; these latter show what conditions are favorable to cooling and condensation, and the amount of condensation and its character, whether rain or snow, are estimated by the help of the graphic diagram. Numbers are thus furnished that can be entered on the chart and show at once the character of the new centre of buoyancy or the directions and velocity of progress of the centre of the indraft and the consequent low barometer.

It is hoped that this work of Professor Abbe's may be, as he expects, of great practical as well as theoretical value. Steps will be taken to test the theoretical scheme by practical and exhaustive applications to current work.

ESTIMATES.

The estimates for 1891 are $4,791.76 more than for 1890, which is an increase of slightly over one-half of one per cent., while the work of this Bureau has increased more than ten per cent. The increase over last year's estimates results in part from the recommendation of an increase in the pay of the assistant professors, who are charged with important duties, demanding a high order of technical and scientific knowledge, who receive only $1,800 yearly, the salary of a fourth-class clerk. The services of several distinguished meteorologists have been already lost, and the continued services of suitable scientists are only to be assured by salaries proportionate to the work. The professor has a salary of four thousand dollars, and his assistants should receive from two thousand to three thousand dollars, according to length and efficiency of service.

The increase also includes an addition of $5,000 to the Signal Service appropriation, which has been asked in order that not only may the current requirements for signaling in the Army be suitably met, but that the Bureau may be enabled to comply with the most reasonable requests of the major general commanding, for telephones, telegraphic and other material for the proper equipment of artillery practice grounds, especially those connected with the coast system of fortifications approved by Congress. These estimates are $247,150.86 less than those for 1888, at which time the present Chief Signal Officer assumed charge of the Bureau; this is also a reduction of $81,209.63 as compared with the amount appropriated for the fiscal year ending June 30, 1888.

Small advances have also been asked for in the estimates to cover a few other cases where the pay received is disproportionate to the work and responsibility.

THE PARIS EXPOSITION.

This Bureau has co-operated, as far as possible, with the International Exposition at Paris by sending an exhibit under the charge of Sergeant Park Morrill, Signal Corps, who was selected as being especially fitted for the duties connected with so great an exhibition. The lack of appropriations prevented any extensive display of instruments or other self-registering apparatus, so that only a few distinctive self-registering instruments of the Signal Corps were on exhibition. The lack of means and time forbade also the preparation of such elaborate and detailed climatic and meteorological charts as this Service is capable of furnishing, but in spite of drawbacks a very fair representation of the methods of this Service was illustrated by publications and charts.

The Chief Signal Officer confined the exhibit to that particular phase of the work of this Service which is in marked contrast to the methods pursued in European countries, that is, in regard to the extended and gratuitous distribution of meteorological data, not only in the way of forecasts and other telegraphic warnings, but also in the distribution of weather data by printed and graphic forms in the shape of maps and diagrams. Few realize perhaps that the gratuitous distribution of meteorological data is greater in the United States in a single week that in all Europe in the entire year.

It is gratifying to learn, unofficially, that three grand prizes have been awarded to this Bureau in connection with its display.

GENERAL REMARKS.

The attention of the Secretary of War is called to the fact that Congress for a number of years has failed to make provisions for the uniform of the enlisted men of the Signal Corps, and an estimate for this purpose is again submitted. The uniform adopted is quiet and unobtrusive, so that its wearer is not prominent through gaudy and showy trappings. It is obvious that Government officials, when serving on such duty as brings them in direct and daily contact with the general public, should have some distinguishing dress for the benefit of persons seeking official information.

The weather code used for enciphering the telegraphic weather reports has been revised during the year and is now thoroughly satisfactory. It is more economical by forty per centum than any code ever used, and it is so arranged that after learning the key the cipher can be translated at sight and with greater speed than has ever before been possible.

In view of the fact that after seventeen years' service nothing was positively known regarding the diurnal temperature changes over the country, the Chief Signal Officer decided to supply this knowledge by taking at certain selected stations special hourly temperature observations. Stations of such number and locality as it was believed would give a general idea of temperature changes were fixed upon, and from January 1 to March 31 observations were taken each hour for fifteen to twenty-four hours, according to the number of observers available at the station. Similarly hourly observations of the pressure of the air have been made during the year. It is believed that these eye observations, supplemented by readings drawn from the self-recording thermographs and barographs, will enable this office to soon outline definitely the diurnal changes of pressure and temperature for the whole of the United States.

It has been the unpleasant duty of the Chief Signal Officer to invite the attention of his superiors to officers of this Corps who are physically and mentally unfitted to perform the duties in connection with the work of the Service. But as regards mental unfitness, it was decided that there was no legal method of retiring such officers. It is certainly an anomalous and extraordinary condition of affairs when a temporary copyist at six hundred dollars cannot be appointed without a rigid mental examination, while it is held that mental deficiencies are no bar to the life tenure of superior officers charged with important public duties. But if officers of the Signal Corps fear no retirement for inefficiency, it also occurs that no promotion is ever possible, no matter how great the ability, how high the soldierly character, nor how zealous and faithful the attention to duty. The competent have no advancement; the incompetent suffer no detriment. Incompetent and inefficient officers, able only to perform simple routine duty, are worse than useless. They are a tax on the country, a drawback to the Corps, and they demoralize the unfortunate enlisted men who serve under or with them.

The reorganization and reduction of the Signal Corps is urged on the grounds of justice, efficiency, and economy. Instead of twenty officers now authorized by law the duties could be performed by thirteen, provided they were competent. The Signal Corps, besides its Chief, should have two majors, five captains, and five first lieutenants. The grade of second lieutenant should expire, and the first lieutenants be recruited, by competitive examination, from the line of the Army from officers of four years' service. Promotion should be made only after examination; a rule indispensable to the success of any bureau charged with technical duties, and which has contributed so much to the great efficiency and high professional standing of the Corps of Engineers, Ordnance, and Medical Departments.

The force of enlisted men, which by existing law is fixed at 470, although appropriations are made for only 315, should be reduced to 200, consisting of 50 first sergeants, with the pay of hospital stewards; 50 sergeants, 50 corporals, and 50 privates, with their present pay. The duties now performed by the remaining 115 men could economically devolve on civilian assistants. In lieu of allowances of all kinds, each enlisted man when not drawing them in kind, should receive a fixed sum proportionate to his station. The observers in great cities or serving as assistant directors to state weather services should be recognized as performing important duties.

Quite radical and important changes have been accomplished during the fiscal year; the most important of which have been the simplification of methods of business and the co-ordination of the work, together with the reorganization of the force in the central office upon a civilian basis. The headquarters of the Bureau for the first time are located in a Government building, with accommodations, though slightly deficient in some respects, far superior to any which it has ever before enjoyed. The simplification of business methods has enabled a reduction of six to be made in the clerical force, while the rearrangement and co-ordination of the work has not only been greatly beneficial to the Service, by concentrating under one head all the stages of work pertaining to that division, but such changes have also increased the speed and facility with which any particular work is performed. The business methods of the Service now conform as nearly as is possible to those in vogue in the great business establishments and corporations in the country. Simple matters, which under old methods often involved a week's delay, are now finally disposed of in a single day.

Among the special advantages arising from this Service, and as an illustration of how widespread are its benefits, and how interwoven are the interests of the country, may be mentioned the result of special weather reports and bulletins announcing the approaching cold waves sent to the observer at Los Angeles, Cal., during the rasin-making, orange-growing, and fruit-growing periods, for the benefit of growers and shippers. In the report of the Stations Officer (Appendix No. 9) will be found statements from nine different firms and corporations regarding the benefits derived from information of this character. They testify to the heavy losses prevented by the protection from approaching rain storms, of rasins and dry fruit, while curing, and as to the benefits and immunities from losses in shipping fruit, which result from these warnings and information. These letters do not confine themselves to simple theoretical statements, but definitely assert that great losses have been averted through timely warnings and information from this Bureau.

I am, very respectfully, your obedient servant,

A. W. GREELY,
Chief Signal Officer.

LIST OF APPENDICES ACCOMPANYING THE REPORT OF THE CHIEF SIGNAL OFFICER OF THE ARMY FOR THE YEAR ENDING JUNE 30, 1889.

1.—Report of the officer in charge of the division of military signaling.

2.—Report of the officer in charge of the forecast division.

3.—Report of the official in charge of the verifications of forecasts.

4.—Report of the officer in charge of the State weather services.

5.—Report of the officer in charge of the records division.

6.—Annual report of the officer in charge of the examiner's division.

7.—Annual report of the disbursing officer.

8.—Annual report of the chief of correspondence division.

9.—Annual report of the officer in charge of the stations division.

10.—Annual report of the officer in charge of the publications division.

11.—Annual report of the officer in charge of the instrument division.

12.—Report on forecasts of cold waves.

13.—Report of Prof. T. Russell, assistant in charge river and flood service.

14.—Rainfall and river outflow in the Mississippi Valley.

15.—Preparatory studies for deductive methods in storm and weather predictions, by Prof. Cleveland Abbe.*

16.—Signal Service stations, latitude, longitude, elevation of barometer, and changes.

17.—Annual meteorological summaries at stations of the Signal Service.

18.—Monthly normal temperatures and departures therefrom of 1888 at stations of the Signal Service.

19.—Monthly and annual mean temperatures for 1888, compiled from all available sources.

20.—Mean of the maximum and the minimum temperature at the cotton-region stations of the Signal Service from April to October, 1888, inclusive.

21.—Maximum and minimum temperatures and annual range of temperature for 1888, compiled from all available sources.

22.—Monthly and annual precipitation for 1888, compiled from all available sources.

23.—Dates of the first and last killing frosts at stations of the Signal Service for the season of 1888–'89.

24.—Dates of closing and opening of navigation on the lakes and rivers at selected stations of the Signal Service for the winter of 1888–'89.

25.—Notation of errors in "Recent Advances in Meteorology," by Prof. William Ferrel, published in the annual report of the Chief Signal Officer, 1885 (Appendix No. 71).

*** Bound separately as Part II of Annual Report of the Chief Signal Officer for 1889.**

APPENDIX I.

REPORT OF THE OFFICER IN CHARGE OF THE DIVISION OF MILITARY SIGNALING.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington, July 31, 1889.

SIR: I have the honor to submit the following report of affairs pertaining to the military signaling division of the office for the year ending June 30, 1889:

The American system for the operation and maintenance of lines of communication in times of active service is now hardly more than a theory. There are well-defined plans, of course, plans based on the experiences of the late war, modified in the light of recent improvements and appliances, but, most unfortunately, they can not be put to the test of actual practice, and unless there be radical change in the military features of the service, or practice with light lines and the field telegraph be given over to the line of the Army, it is impracticable to do more than keep informed of the progress of other nations in the development of material and methods of conveying intelligence and to endeavor to judge of the merits of improvements by office test rather than field trial.

The service is possessed of eleven lance trucks, four battery wagons, and nine wire wagons, disposed as follows: Nine lance trucks, two battery wagons and seven wire wagons at Washington Barracks; one lance truck, one battery wagon, and one wire wagon at Fort Leavenworth; and one lance truck, one battery wagon, and one wire wagon at the Presidio of San Francisco.

The section in San Francisco was sent out recently that means might be readily available at some point on the Pacific Slope of replacing wire connections in case of disturbance to commercial lines, that experience might be gained in the management of the train by troops of the line in that division, and that the equipment might be used as an auxiliary in artillery practice. Lack of appropriation deferred the thorough overhauling of this section till the incoming fiscal year, and the relatively small amount required to put it in working condition can then be spared only at the expense of other current needs.

The portions of train stored at Washington Barracks have not been out of sheds for use during the year. They are dismantled of all battery and line material except lances, the policy having been, since appropriations will not admit of perfecting and maintaining the equipment, to make possible the use of the ordinary army wagon for all purposes of transport required of the train. The essay at cutting loose from sole dependence on the field train has borne fruit in the device of Lieutenant Greene, Signal Corps. This device consists of a standard for holding the wire reels, which may be easily fitted to the army or any other wagon. It is proposed that the light wire for field lines be uniformly carried on specially constructed reels, and that these reels not only serve the purpose of preserving the wire from kinks and damage, but that, in conjunction with the standard, they do duty in the distribution of wire in laying the line, as also in taking it up. A model of the device has been constructed and works well.

In endeavoring to dispense with the lance truck by substitution of the army wagon, the weight of the wagon and the length of the lances are the unfavorable elements. The truck itself when loaded is unwieldly, and it does not seem that the loaded wagon would be less so, even if the bed could be made to hold the long lances. Of course the load may be lightened by carrying fewer poles, but that implies more wagons. Other governments find themselves confronted by the same problem, and in some services the question of weight is solved by reduction in the size of lances, in others by the selection of light material. A combination of both features within practical limits is desirable, and it seems not unlikely that the bamboo of Brazil will be found to possess the requisite toughness with minimum weight.

For special purposes, such as raising the wire at crossings of roads or supporting field cable in villages and camps, a small proportion of telescopic poles or those capable of elongation should be provided, our present equipment consisting solely of the 17-foot pine lance. It is obvious that in the ordinarily well-wooded districts of our country a great variety of material is available from which poles could be improvised, but as the necessity for the use of a military field line implies rapidity of motion, it is evident that no dependence should be placed upon material which *may* be obtained, but that the equipment be *already* perfected.

The army wagon or the ambulance will also serve for carriage of battery and material, keys, sounders, office equipment, etc., and the field telegraph may undoubtedly be laid and operated without specially constructed wagons, but the stress of necessity only should warrant dependence on such an improvised train. Common prudence suggests preparation in advance to meet the emergency, but the preparation which it is found possible to make under existing conditions does not comprehend the organization and equipment of a field train and its service by a body of experts.

This is impracticable from lack of organization, men, and means, and the best that can be done is to retard deterioration in the parts of the train still remaining, and make preparation that the army wagon may be employed for train use when the service shall have nothing else to depend upon.

Quite as much difficulty has been experienced in keeping up the battery and line material and other appurtenances of the equipment as the train itself. Outside of the Pacific and Leavenworth sections there are remaining not to exceed two hundred insulators of the light field pattern; there are about fifteen hundred lances, but no batteries, etc., in actual readiness for instant use; not to exceed 20 miles of light wire on hand, and something less than 4 miles of light field cable. In fact, we have the shadow rather than the substance of a field equipment.

FIELD TELEPHONE KIT.

The field telephone kit has received attention during the year and satisfactory progress has been made towards its completion.

To effect the desired change to the best advantage the following communication was addressed to the manager of the American Bell Telephone Company:

"I have the honor to acknowledge receipt of your communication of December 29, informing that the company will remodel the telephones and transmitters bought by the Signal Service of the Gold and Stock Company, this service bearing expense of reconstruction.

"As anticipated by you, the proposition that the company execute the work is entirely satisfactory; in fact, is much the better course so far as this office is concerned, as the wide experience of the company will be brought to bear directly in the interest of the service, and it is very probable a much better equipment will result than if the change were made by less experienced hands.

"In relation to the instruments in question, it is, of course, understood that the Government loses no part of its interest in them on account of any change they may undergo; simply that it pay the cost of such change. As to other instruments which may be modeled by the company after the desired equipment, the service, of course, expects to pay, as heretofore, the rental charged by the company for any it may procure.

"The office has no device or apparatus which will serve wholly as a model in the reconstruction, but a sample of the apparatus now in use at a few military posts, known as the Eccard knapsack telephone, may be of some assistance in making clear what it is desired to attain, and one of these kits will be placed at your disposal.

"The office has also a device used in the German army, the trumpet telephone, which may present some desirable features, especially in the manner of making connections. This will also be sent.

"The Eccard kit, as you will see, is an ingenious arrangement of the Bell telephone, Morse key, and battery. The key takes the place of call-box; and the telephone, besides its ordinary use, plays the part of sounder for telegraphic purposes, giving as such a distinct, sharp sound and making its use possible under heavy cannonading.

"The main objection, in fact the only serious one, to the kit is the necessity for shifting the telephone from mouth to ear and back again, the single telephone being required to perform the double office of transmitter and receiver, and it is with the object of overcoming this difficulty, by joining a battery-transmitter and magneto-receiver in a single piece that the office seeks your advice and aid.

"As giving some intimation of what is desired, your attention is invited to the accompanying catalogue. From the illustration therein given a fair idea of what is desired in the change contemplated may be obtained, *i. e.*, combination of receiver and transmitter in one handy piece which, in connection with the light portable Eccard equipment and the reel carrying a light insulated double conductor, may be readily used in the field.

"The instruments are designed for military purposes only—in time of peace, on rifle ranges and in connection with artillery practice; and in case of war, for reconnaissance and outpost duty, for quickly establishing communication between important points, for transmitting orders during battles, and for such other military purposes as circumstances may indicate.

"The apparatus should be so arranged that the parties may call each other at any time and converse freely. Receiver and transmitter should be conveniently combined so that one hand only will be required to hold them at ear and mouth, the calling to be done by means of a telegraph key, as in the Eccard equipment. The key feature is essential, permitting the use of the instrument for telegraphing under conditions when noise and confusion make talking inaudible.

"The distances through which it is desirable to hold conversation it is believed will not exceed 10 miles. The wire to be carried will be in lengths of about one-half mile, connections being made in manner similar to those shown in reel equipment.

"From the two crown telephones and two Edison transmitters expressed to you it is desired that two sets may be constructed.

"Upon completion of reconstruction of these four telephones and demonstration of their practical utility, arrangements, it is hoped, may be made by which all other telephones owned by the service can be recalled and sent to you for remodeling.

"It does not seem improbable that a new industry may be opened up by this attempt to perfect the telephone for field use. However this may be, it is quite obvious that much benefit will result in a military point from the possession of such an equipment, and there is but little doubt that American ingenuity and enterprise can put into practical form the idea of constant and instant communication between the commander of an army and his subordinates in the field, so that in case of war our field equipment shall be second to none." * * *

The device submitted in consequence of this letter is an improvement on the old, but in various details is not up to all requirements.

The receiver and transmitter are fairly well combined, but there are exposed connections liable to injury in careless hands. The added device for calling is not necessary, the old call by key filling the conditions as well without increased weight.

It is plain, however, that a most satisfactory kit will eventually result.

CABLES.

For the service of the telephone equipment as well as for rapid work with light telegraph lines in the immediate front, when delays incidental to the insulating of naked wire could not be tolerated, light field-cables are essential.

The great cost of such cables has made it impossible to obtain a supply in any degree commensurate with its importance as a factor in establishing communication rapidly; but it is a satisfaction to find that a strong, pliable double conductor can be obtained at home in emergency.

Foreign nations give great weight to the employment of cable in the field.

There are three kinds in use by the *Belgian* field telegraph, the advance-post, the field, and the river cable. The advance-post cable is constructed with double conductor. The core consists of a copper wire braided with silk and insulated with gutta-percha; the return conductor is formed by fine copper wires wound spirally around the insulation of the inner conductor. The whole is braided with hemp, and has a total diameter of 0.117 inch.

The field cable consists of a copper wire wound with six strands of iron wire. The conductor is insulated with rubber, wound spirally with ribbon, and braided with hemp soaked in a plastic insulating compound. Its total diameter is 0.244 inch; weight per mile, 255 pounds; tensile strength, 440 pounds.

The cable for crossing rivers is stronger than the field, and for protection and to increase tensile strength is wound with eight steel ropes, each composed of fourteen strands.

The proportion of cable to naked wire carried by the field sections is as 5 to 4.

The field cable used in *Denmark* consists of a conductor of three iron wires, each of a diameter of 0.031 inch, insulated with rubber and covered with ribbon soaked in paraffine. The total diameter is 0.253 inch; weight per mile, 224 pounds; tensile strength, about 416 pounds, and electrical resistance, about 124 ohms.

The proportion of field cable to naked wire in use in the Danish service is as 1 to 10.

The double-conductor advance-post cable of the *Germans* is constructed by Siemens & Halske, of Berlin. Military authorities require that under a strain of from 77 to 88 pounds no change in electrical or other qualities be shown. This cable consists of a copper conductor, insulated with gutta-percha and covered with cotton; this is wound spirally with eight fine copper wires, which serve as a return conductor. The whole is braided with hemp, and has a diameter of 0.18 inch. Its tensile strength is 150 pounds, weight per mile, 78 pounds, and electrical resistance of inner conductor, 97 ohms. This cable is transported upon light drums in lengths of about one-third of a mile, and weighs, with drum, about 29 pounds.

The present *Prussian* field cable consists of a tinned-steel wire wound with six copper wires. This conductor is insulated with rubber, covered with a ribbon, and braided with hemp soaked in insulating compound. The total diameter of this field cable is 0.234 inch, weight per mile about 170 pounds; electrical resistance per mile, about 31 ohms, and tensile strength 271 pounds.

The river cable consists of a rope of seven copper strands insulated with rubber, wound with felt and tarred hemp, and protected by sixteen tinned-iron wires each of a diameter of 0.10 inch.

In the *English* service there are two kinds of cable used, the advance-post cable (Buchholtz's) adopted in 1881, and the field cable. The former differs from the German in that it has a diameter of only 0.14 inch. The electrical resistance per mile of both conductors is 135 ohms; weight, 56 pounds, and tensile strength 119 pounds.

The field cable consists of a tinned-steel wire wound with six copper wires. Insulation is effected by rubber, a ribbon, and hemp braid soaked in insulating compound. Its diameter is 0.234 inch; weight per mile, 170 pounds; electrical resistance per mile, 31 ohms, and tensile strength 271 pounds.

The proportion of cable to naked wire carried by the English field telegraph is as 0.83 to 1.

In *France* there are three types of cable in use, each of which has its province of usefulness, viz.: the field, the light field, and the cavalry.

The field cable consists of seven copper wires, each of 0.016 inch diameter, insulated with gutta-percha and wound with silk soaked in a solution of rubber. A braid of yarn soaked in compound is added for exterior protection. Weight per mile is 99 pounds; total diameter is 0.176 inch, and tensile strength 178 pounds.

The light field cable for rapid marches is used for telegraphic or telephonic communication when weight and means of transportation are to be reduced to the minimum. The weight of two-thirds of a mile of this cable, including two reels, is about 29 pounds.

The cavalry cable consists of two iron and one copper wire, wound with cotton and covered with a mixture of gutta-percha. The whole is braided with yarn and drawn through asphalt. Its diameter is 0.117 inch, and tensile strength 88 pounds. This cable is used for communication within the sphere of action of cavalry. In each cavalry regiment six men are instructed as signalists, who are equipped with one and one-fifth miles of this cable.

The proportion of cable to naked wire in the French field telegraph is as 6.2 to 1.

In *Holland* the field cable consists of a tinned-steel wire wound with six copper wires. This conductor is insulated with rubber, and covered with ribbon and braid soaked in insulating compound. The total diameter of the cable is 0.234 inch; weight per mile, 170 pounds; electrical resistance, 31 ohms; and tensile strength, 271 pounds.

For river crossings, a strong cable is used consisting of a copper wire of 0.049 inch diameter, insulated with gutta-percha, braided with yarn, and protected by twenty galvanized-iron wires each of 0.039 inch diameter. The total diameter of this river cable is 0.31 inch; weight per mile, 568 pounds; resistance about 26 ohms, and tensile strength 1,230 pounds.

The proportion of cable to naked wire in use is as 1.3 to 1.

In *India* the field cable in use since 1869 consists of a tinned-copper wire wound with six tinned-steel wires. This wire rope is insulated with rubber and wound spirally with ribbon soaked in a solution of rubber. Its total diameter is 0.205 inch; resistance per mile, about 29 ohms; weight, 277 pounds, and tensile strength 600 pounds.

The *Italian* field cable consists of a single copper conductor of a diameter of 0.064 inch, which is insulated with rubber and wound spirally with a linen ribbon soaked in a solution of rubber. Its total diameter is 0.21 inch; electrical resistance per mile, about 15 ohms; weight per mile, 185 pounds, and tensile strength 99 pounds.

The proportion of cable to naked wire in use is as 0.70 to 1.

The field cable of *Austria-Hungary* consists of one steel wire surrounded by six copper wires. Insulation is effected by rubber and the whole braided with hemp. Its total diameter is 0.234 inch; weight per mile, 170 pounds; tensile strength, 271 pounds.

The new double conductor advance-post cable is similar to that of the German field telegraph with a total diameter of 0.176 inch.

The proportion of cable to naked wire is as 0.47 to 1.

The three mountain telegraph divisions are equipped with cable and insulated wire only.

The *Russian* field cable is similar to that used in Austria. It consists of a tinned-copper wire surrounded by six tinned-steel wires. This is insulated with rubber and braided with hemp to a total diameter of about 0.137 inch. The weight per mile is about 160 pounds; tensile strength, 299 pounds.

The proportion of cable to naked wire is as 0.25 to 1.

Besides the seventeen field-telegraph parks in the Russian army, there are, as in France, from ten to twelve men in each cavalry regiment instructed as operators for advance-post and reconnaissance duty, who are also equipped with cable.

There are two kinds of field cable in use in *Sweden*. One, consisting of three copper wires, each of 0.039 inch diameter, is insulated with two layers of vulcanized rubber, and wound with felt to a total diameter of 0.21 inch. Its weight per mile is 134 pounds, and tensile strength 114 pounds. The other, consisting of one steel and six copper wires, each of a diameter of 0.02 inch, is insulated by vulcanized rubber, linen ribbon soaked in rubber, and tarred hemp. Its total diameter is 0.25 inch; weight per mile, 173 pounds, and tensile strength 308 pounds.

The proportion of cable to naked wire is as 0.2 to 1.

In *Switzerland* there are two kinds of cable used which differ only as to insulation. The older of these two cables consists of seven tinned-iron wires, each of 0.028 inch diameter. It is insulated with two layers of rubber and wound spirally with two ribbons soaked in a solution of rubber. Its total diameter is about 0.21 inch; electrical resistance, about 77 ohms per mile; weight, 181 pounds, and tensile strength about 260 pounds.

The latter cable is similar, except that it is covered with only one ribbon soaked in a solution of rubber, reducing the total diameter to 0.20 inch, weight to 159 pounds per mile, and tensile strength to about 249 pounds.

Cable and naked wire are used in equal proportion.

The *Spanish* field cable consists of two heavy copper wires, each insulated from the other by gutta-percha and braided wool. The whole is covered with hemp and a ribbon soaked in a solution of rubber, and has a diameter of 0.176 inch. Its weight per mile is 68 pounds, and tensile strength 119 pounds. This cable is used for both the field and advance-post service. For the former it is wound on drums containing about two-thirds of a mile; while for the latter service a smaller drum is used which holds but half that amount.

BALLOONS FOR MILITARY PURPOSES.

Although the subject is involved in mysterious report and remark, and the claim is advanced that a dirigible balloon has been accomplished in one of the countries abroad, a careful inquiry shows it to be probable that the claim is based on a single performance under conditions so favorable as to be almost abnormal.

On the other hand, the captive balloon, as an accessory of reconnaissance, has established its merits to the apparent satisfaction of several of the powers (France, Germany, Italy, Russia, Spain, and China). These countries have already provided themselves with balloon train equipment, and others (Denmark, Switzerland, Turkey, and Austria) are negotiating for them.

The system of Gabriel Yon, of Paris, is the one most in favor in Europe. His equipment consists of a balloon park, of three wagons carrying windlass, gas generator, and balloon proper, with all appurtenances. Four different patterns are made, according to the service for which intended, viz.: fortress, field, field (extra light), and electric signaling. In the two former the windlass for the management of the balloon is operated by steam, in the others by hand.

A full description of the method of generating, washing, and drying the gas, and delivering it to the balloon, also of the composition and construction of the aerostat proper, with weights and cost of various parts and ascensional force of the different varieties of equipment, is on file at this office. The apparatus can only be worked where the water supply at hand is unlimited, as the hydrogen gas with which the balloon is inflated is obtained by its decomposition. Telephonic communication from the balloon is contemplated through the medium of a conductor imbedded in the anchor rope.

FIELD-GLASSES.

The great advantage derived from the use of the field-glass in signaling, reconnaissance, and in general observation of military movements and positions is too apparent to require explanation or discussion. It has been the policy of the service to obtain the best, regardless of time, trouble, or expense, and in this endeavor not only have many of superior make been obtained and examined, but the theory of construction has been considered in connection with the attainment of specific results with the ultimate purpose of securing the utmost benefit possible from combinations of lenses.

In reaching a conclusion relative to the capabilities of glasses it is necessary to establish a measure or unit to which the various qualities may be referred as standard. This standard is found in the human eye, and the properties of a glass are, therefore, not unnaturally expressed in terms of the power, field, light, etc., of the unaided eye.

It is apparent that different persons have eyes of very different capabilities. Some are short, others far, sighted; there are normal, excellent, sharp, or weak eyes, and the standard is, therefore, a varying quantity. This relative standard is satisfactory, however, since no one can use the eyes of another, but must judge by his own, good or bad.

For every eye there is a certain distance at which objects are seen most plainly, called the "visual distance." It amounts to, with short-sighted eyes, 3 to 6 inches; with normal eyes, 8 to 14 inches; with far-sighted eyes, 16 to 28 inches.

Power.—At the visual distance all objects appear in their natural size, or, numerically expressed, magnified by 1. At a distance less than the visual, they are indistinct, blurred, and imperfectly defined; at greater than the visual distance, however (with normal eyes), objects are clear and well defined, but diminished in size, and the more so as they are further removed.

Light.—The illumination of an object when observed with the naked eye is impressed upon the retina with a brightness in strict proportion to that of the object itself, whether it lie in the dazzling sunlight, in ordinary daylight, in the light of the moon, or the uncertain glimmer of a dark night. If an object be viewed under equal illuminating conditions alternately with the naked eye and with a glass, the brightness of the image seen with the naked eye may be represented by 1; while that of the image in the glass will generally differ, being greater or less.

Field.—Maintaining head and eyes as motionless as possible, the dimensions of the image which can be held in view corresponds to a visual angle of 30 degrees; in other words, the visual field of the naked eye is 30 degrees. That of a field-glass is always smaller, while the field of a telescope is still less.

Definition.—One of the chief qualities of the eye is its sharpness or power of defining outlines and details distinctly. Relative characteristics in this respect may be determined in various ways.

Thus the distance at which printed matter can be read, or the details of a distant object distinguished, will give a fair measure of the defining power of the eye; but a better method is to express the definition of sight by angular measurement—that is, by the determination of the smallest visual angle giving clear results. Experience teaches that this angle for the normal eye (with good light and favorable color conditions) is about 40 seconds, and it is, therefore, possible to determine the smallest object which can just be seen, well defined, at any arbitrary distance. For instance, at a distance of 15 feet an object can be seen which is one-twentieth of an inch high or broad; at 30 feet distance, consequently, the object must be twice the size (one-tenth of an inch) to be seen; and so on relatively within limits, as distance increases; but as the distance becomes greater, sharpness of vision is impaired materially by the interposing atmosphere and is also affected by color contrasts and conditions of illumination.

It therefore follows that at considerable distances objects which subtend a visual angle of 40 seconds are no longer clearly defined, but become so only as this angle approaches 60, 120, 180, or more seconds.

The capabilities of the normal unassisted eye may therefore be expressed as follows: Power, 1; light, 1; field, 30 degrees; definition, 40 seconds to 3 minutes.

To the preceding the qualities and capability of field-glasses may be referred.

The most important and essential quality of a glass is definition, *i. e.*, the sharpness, clearness, and purity of the images seen through it. To obtain good definition it is necessary that spherical and chromatic aberration be overcome, that the polish of the lenses be as perfect as possible, that the cement possess no inequalities, that the lenses be well focused, that there be no dampness in the interior of the tubes, and, generally, that the instrument be without optical defect.

Faults in this direction are discovered at once by examination of definition, whereas in determining the other constants they are less noticeable. In comparing the definition of any two instruments, it is ordinarily only necessary to scan distant objects and to observe to what extent details may be distinguished.

The following test may also be used: Focus on printed matter at a distance just beyond that at which perfect clearness is given and gradually approach till the letters are distinctly defined. The instrument with which the print can be read at the greatest distance has the best definition.

To express definition in an absolute measure, use, instead of printed matter, a white sheet of paper upon which a series of heavy lines are drawn at intervals equivalent to the thickness. Focus upon this, and approach gradually from a point where the impression of a uniform gray field ceases and the black lines and white intervals begin to appear distinct and defined.

Let the distance thus found be 20 yards and the thickness of the lines and intervals between them one-tenth inch. The circumference of a circle with a radius of 20 yards or 7,200 tenths of inches is 14,400x3.1416 or 45,240 tenths of inches; but a circumference equals 360 degrees or (360x60x60) 1,296,000 seconds.

If, therefore, 45,240 tenths of inches correspond to 1,296,000 seconds, then one-tenth inch equals 1,296,000 divided by 45,240, or 28.6 seconds. The definition is therefore 28.6 seconds, or practically half a minute.

The next most important constant of the glass is power.

Power may be approximately determined by dividing the diameter of the object-glass by that of the circle of light which appears in the eye-piece after focusing on a distant object.

This method for small powers gives fairly accurate results, but is not reliable for great. Another method is as follows:

Observe an object through the glass with one eye and at the same time with the other eye unaided. A comparison of the two images gives at a glance an idea of the increase in size due to the magnifying power of the glass, and this power may be determined by comparison of the dimensions of the two images after accurate measurement.

Another constant of the glass is the light of its image. In most cases with instruments of equal quality, differing only as to power, the instrument which shows the brightest image gives the most satisfaction. An exception is found only in observing natural and artificial sources of light which appear sufficiently plain to the naked eye itself.

The light of the field-glass is expressed by the number which shows how many times brighter the object appears through the instrument than to the naked eye. Light is a function of the dimensions of the object-glass and of the power of the instrument, and is sometimes determined by dividing the square of the objective aperture (expressed in millimeters) by the square of the power; but thus far no absolute and satisfactory rule has been given whereby the proportion of light received through the instrument to that received by the unaided eye may be definitely and reliably expressed, and satisfaction only can be obtained in the selection of a glass for light by actual use of the instrument under both favorable and unfavorable conditions.

In determining the field of a glass, however, *i. e.*, the extent of country that can be observed in any fixed position of the glass, it is possible to arrive at quite definite conclusions. The human eye has, of course, the greatest field, and, as before mentioned, is about 30 degrees in the normal eye, increased to 45 when both eyes are used; but in obtaining power, unfortunately, field is so intimately related that it can only be done at the expense of the latter, and to this alone is due the fact that no single field-glass can be constructed to subserve the purpose of minute examination of details at a distance and at the same time take in sufficient territory to render the glass suitable for general reconnaissance.

The capabilities of glasses, including telescopes, lie between the following limits:

(1) Power between 2 and 1,000, and it is even possible to reach a power of 2,000 and 3,000.

(2) Light may be 0.01 to 200 times that of the unaided eye.

(3) Field measures in most favorable case, 10 degrees; in the most unfavorable, 0.1 of a degree.

(4) Definition varies between 40 seconds and 0.1 of a second.

Thus, as a maximum, an object may be seen by means of telescopes, 1,000 to 3,000 times magnified, 200 times brighter and 400 times sharper than with the naked eye.

If these advantages could be fully utilized for military purposes the use of glasses would be extraordinary, a power of 1,000 practically effecting the same purpose as the approch of the observed object to one-thousandth of the distance. A hostile command 10 miles distant could be seen theoretically as well as if it were only 53 feet away, and the slightest movement of each single man would become visible. Of course no such wonderful effect is physically practicable, and the limiting conditions increase greatly in proportion as either one or the other of the qualities, power, field, etc., is specially sought.

While astronomers require only that the telescope be made as capable as possible in an optical point of view, and make all other conditions subordinate to this one, the military, to whom the glass is simply an accessory, make other conditions of the first importance. The glass must have suitable form, small volume, little weight, and it is necessary that it be used without support, mounted or dismounted.

The capability of the instrument, however, is thereby much limited; great powers give plain images only with relatively long tubes; glasses must be held the steadier the more they magnify; and with increasing power all vibrations become more troublesome and render minute observations very difficult or impossible.

For the mounted man, a glass of but 4, or at most 5, powers can be used to advantage; on foot, with free hand, instruments of not to exceed 10 powers can be used. If more than 10 powers are desired, a holder becomes necessary, and if the holder is intended to be portable, a greater power than 50 is not practicable, as the movement of the air or slightest touch of the hand sets up vibrations that render clear vision impossible.

Also, while inverted images are not objectionable to the astronomer, the military require an upright image, entailing an additional lens combination and in consequence a decrease in power, light, and definition. It is clear, therefore, that high expectations, founded on the possibilities of achieving great power, should not be entertained. In fact, it is seldom possible to discover objects with the field-glass which are entirely invisible to the naked eye, the function of these glasses rather being to bring out and define objects which to the naked eye appear indistinct and doubtful.

The field-glasses procured by this service last year are in all respects admirable for the purpose intended; they are of high power (7), too high for purposes of general reconnaissance, as the field is too limited; they are intended to supplement the lower power field-glass, for which this service is now seeking, by giving to the observer an instrument which he can use free-hand and yet obtain considerable power with excellent definition. In fact, the instrument possesses all the power needed short of that to be obtained by the telescope, and it only remains to procure a suitable instrument of large field. This, of course, can only be done at the expense of power, but observation and repeated examinations develop that it is unnecessary to go much, if any, below 5 power to obtain the requisite field and light required in a glass to be used by the mounted man in scanning the country on reconnaissance, or by the artillery-man in observing the effects of first shots.

Investigation has also shown that our telescope (30 power) is, everything considered, as satisfactory as can be procured. It is readily portable and is used in connection with the holder, by which it is attached to tree, stump, or other support, and in the hands of any but inexperienced persons is of wonderful assistance in making out and defining the character of distant objects invisible to the unassisted eye and indistinct with the field-glass.

Supply.—During the year 120 requisitions have been received, and, as far as practicable, the stores requested have been furnished; but in respect to rifle-range appurtenances and especially those required under recent orders in connection with artillery instruction and practice, lack of funds and needs in other directions have compelled the office to defer their equipment to the incoming year.

It does not seem unreasonable, in view of the large expenditures contemplated by the Government for fortifications and heavy ordnance, to hope that, with the object of giving every facility for practice with such ordnance, increased appropriations may be expected for the purchase of electrical and signal appliances to be used in such connection. It was at first desired by the commanding general that at least eleven of the more important artillery stations should be fully equipped, such equipment comprehending not only the usual signal apparatus, but also meteorological instruments (anemometers, thermometers, barometers, hygroscopes, wind vanes, etc.), batteries, telephones, and line material, and machines for making electrical tests and measurements.

It was found after taking account of supplies at the posts, stock on hand at depot, and such as were available by transfer that to supply the balance would alone more than exhaust the amount appropriated for military signaling, and it was necessary to abandon the idea of supplying more than six of the most important by reducing requisitions and holding over such items as must be purchased till the new appropriation should become available.

To procure satisfactory telephone equipment for rifle ranges would also alone require more than the appropriation, and in consequence the policy which it is obviously the better one to pursue—that is, of procuring the telephone by purchase outright—could not be followed, and the best that could be done was to rent for a limited period. The expediency of purchase over rental is made apparent by stating that the annual rental of an instrument is one-fifth of its cost price.

The supply of heliographs has been augmented by the purchase of a sufficient number to partially equip 45 posts; included in this supply are ten of the station model with larger mirror and without tripod, which are not intended for general distribution, but for emergency where long range is to be attained. There are many posts still unsupplied with the heliograph, and the commanding general of one department, in order to give as wide distribution as possible, furnished but one instrument to each post so far as the number allotted to his department would go. There are many officers and men who have never seen the instrument, and as instructions require that troops should become practiced in its use, further expenditures in this direction are recommended when practicable.

Experiment with flash lanterns, new forms of torch, bombs, rockets, signal lights, and kindred equipments have necessarily been very meager or wholly deferred in consequence of pressure in other directions, but it is hoped that, as in case of the heliograph, a new and more perfect night signaling equipment may be evolved by a combination of the most desirable features of the various flash lanterns procured for examination.

Instruction and practice in signaling continued at military posts under the old system. From reports received, the minimum number of officers under instruction during any one month is 9, against 12 during the preceding year, and the maximum 51 against 65; while the minimum and maximum numbers of enlisted men who received instruction, as compared with those of the preceding year, are 337 and 715, respectively, to 392 and 727.

At Fort Monroe signal practice was had in connection with artillery practice and mortar firing.

At Fort Columbus all battery officers and non-commissioned officers had practical signaling in sending angles pertaining to artillery instruction.

At Fort Adams signalmen were employed during mortar practice.

At Fort Barrancas the guard formed one station during practice.

At Fort Niagara flag practice was had at a distance of 9 miles.

At Fort Myer flag practice was had between the post and Munson's Hill, a distance of 8 miles, with satisfactory results.

At Fort Porter three men are reported as being able to receive faster than it is possible to send.

At Fort Totten more than four men to each company are reported as having a good knowledge of signaling with flag and heliograph.

The troops of Fort Douglas received instruction while in camp in Strawberry Valley.

The troops of Forts Robinson and Niobrara, while at Camp Brooke, had daily signal practice with the grand guard on the hills in the vicinity.

At the camp of instruction near Fort Casper, Wyo., signal stations were occasionally established in connection with the advanced outposts.

At Fort Sidney stations were established at Round-House Rock and Camp Clarke, distance 7 miles, and communication had with flag and torch.

At Fort Bowie communication by heliograph was had between the post and stations, established at Bowie Peak, Middle Pass, Camp of Troop C, Fourth Cavalry, and Sulphur Springs.

At Fort Apache heliograph practice was had over a range of 25 miles.

At Fort Bayard communication was effected over a range of 40 miles by heliograph and 10 miles by flag.

The troops at Fort Huachuca established communication with Dragoon Mountain, Cochise Stronghold, and Whetstone Mountain.

Those at Fort Union established successful communication over a range of 50 miles; signaling by moonlight was also tried with the heliograph equipment, but was not entirely successful.

At Fort Mojave the troops had heliograph practice over a range of 20 miles.

During the encampment of the First Infantry at Santa Barbara all non-commissioned officers of the battalion (8 companies) received instruction in signaling.

The troops at Vancouver Barracks established successful communication with Portland Heights.

Orders heretofore existing respecting instruction in signaling have been materially modified during the year. The following regulations in relation thereto are at present in force:

"In time of peace, department commanders will attend to the instruction and practice in military signaling of the line officers and enlisted men in their departments. To this end they will cause an acting signal officer to be appointed at each military post, who shall give the necessary instruction and supervise field practice during at least two months of each year. Constant instruction will be maintained until at least one officer and four men of each company are proficient in the exchange of both day and night signals by flag, heliograph, or other device. The detail will be changed from time to time so as to insure that each company shall always have a sufficient number of instructed officers and men competent to maintain, by signals, distant communication in the field. Monthly reports of instruction and practice will be rendered to the Chief Signal Officer through department commanders.

Whenever in the judgment of the department commander such course is necessary for thorough supervision of signal practice, an officer of the department staff may be designated as signal officer of the department.

Each post shall be visited at least once annually by an inspector, under orders from the commanding general, for the purpose of determining the relative efficiency in signaling of all officers and enlisted men who have had instruction and practice. A report of such inspection will be made to the Secretary of War."

In addition to the change in methods by which the supervision of department commanders over instruction and practice in signaling of the officers and men in their departments is enjoined, a radical change has been made in the signal code of the Army in consequence of the following order:

"The Secretary of War having approved a report of the Chief Signal Officer which proposes simplification of signal instructions, and renders possible in time of war the instant employment and utilization of skilled telegraphers for military purposes, it is hereby ordered that the American Morse Code be used by the Army for all purposes of signaling, whether visual or acoustic.

"The use of the English Morse, or Continental Code, imposed by General Orders No. 12, series of 1886, from this office, will be discontinued throughout the Army upon receipt of this order."

In carrying into effect the provisions of this order the following code card was issued:

U. S. SIGNAL AND TELEGRAPH CODE.

[Authorized by G. O. No. 59, A. G. O., June 28, 1889.]

ALPHABET.

A - —	F - — -	K — - —	P - - - - -	U - - —
B — - - -	G — — -	L ——	Q - - — -	V - - - —
C - - -	H - - - -	M — —	R - - -	W - — —
D — - -	I - -	N — -	S - - -	X - — - -
E -	J — - — -	O - -	T —	Y - - - -
		Z - - - -	& - - - -	

NUMERALS.

1 - — — -	3 - - - — -	5 — — —	7 — — - -	9 — - - —
2 - - — - -	4 - - - - —	6 - - - - - -	8 — - - - -	0 ———

PUNCTUATION MARKS.

Comma - — - —	Interrogation — - - — -	Parenthesis Pn
Semicolon Si	Quotation Qn	Brackets Bx
Colon Ko	Paragraph — — — —	Dollar mark Sx
Period - - — — - -	Exclamation — — — -	Dash Dx
	Hyphen Hx	Underline Ux

NOTE.—A fraction is made by inserting a dot between the numerator and denominator—Example, ⅞, — — - - - — - - - -

SIGNALS AND ABBREVIATIONS.

1. Wait a moment.
4. Start me.
5. Have you anything for me?
7. Are you ready?
8. Busy on other wires (or stations).
9. Train order (or important military message)—give way.
13. Do you understand?
18. What is the matter?
27. Adjust your magnet (or flash).
30. Circuit closed (or close station).
44. Answer quick.
73. Accept compliments.
92. Deliver (ed).
134. Who is at the key (flag, or torch)?

Ahr. Another.

Ans. Answer.
Ck. Check.
Col. Collect.
D H. Dead head.
G A. Go ahead.
G E. Good evening.
G M. Good morning.
G N. Good night.
G R. Government rate.
N M. No more.
O B. Official business.
O K. All right.
Opr. Operator.
Pd. Paid.
Qk. Quick.
Sig. Signature.

TO SIGNAL WITH FLAG OR TORCH.

The flagman faces exactly toward the communicating station; staff is vertical in front of center of body, butt at height of waist. The *dot* (-) is represented by a motion to the right, and the *dash* (—) by a motion to the left of the sender. The *space*, whether separating elements of *spaced characters* (C, O, R, Y, Z, and "&"), or separating words, will be represented by a "front" motion.

Thus the motions:

Right, right, front, right, represent C.
Right, front, right, represent O.
Right, front, right, right, represent R.
Right, right, front, right, right, represent Y.
Right, right, right, front, right, represent Z.
Right, front, right, right, right, represent &.

Each motion will embrace an arc of 90°, starting from and returning to the vertical.

The *long dash* (letter "L" and numeral "naught") is distinguished from the "T" dash by a slight pause at the lowest point of dip, and with this exception there will be no pause whatever between the motions required for any single letter.

A slight pause will be made between letters.

At the end of each word, abbreviation, or conventional signal the space signal, or "front" motion, is made, *preceded and followed by a pause* equivalent to that made between letters.

CONVENTIONAL SIGNALS FOR FLAG OR TORCH.

Note.—Each station should have its characteristic signal or call letter, as Washington, "W," and each operator his personal signal, as Jones, "Jo."

To call a station.—Signal the "call letter" of the station required, or, if the call letter be not known, signal "A" without pause until acknowledged. The calling station will then proceed with the message.

To acknowledge a call.—Signal "I" three times, followed by "front" and the call letter of the acknowledging station.

To break or stop the signals from the sending station.—Signal "A" without pause until acknowledged.

To start the sending station after breaking.—Signal "G A," followed by "front" and the last word correctly received; the sender will immediately resume his message, beginning with the word indicated by the receiver. If nothing has been received, signal "R R;" the sender will then repeat all.

Error in sending.—Signal seven dots (- - - - - - -) rapidly, followed by "front," and resume the message, beginning with the last word correctly sent.

End of address.—Signal the period (- - — — - -), followed by "front."

Signature follows.—Signal "Sig," followed by "front."

To acknowledge receipt of a message.—Signal "O K," followed by "front" and personal signal or initial of receiver.

CONVENTIONAL SIGNALS FOR HELIOGRAPH OR FLASH LANTERN.

To call a station.—Turn a steady flash on the station and keep it there until answered by a steady flash. Both stations will then adjust, each on the other's flash. When adjustments are satisfactory, the station called will acknowledge and cut off its flash, and the calling station will proceed with the message.

To acknowledge a call—Signal "I" three times, followed by the call letter of the acknowledging station.

To break or stop the signals from the sending station.—Signal "A" without pause until answered by a steady flash.

To start the sending station after breaking.—Signal "G A," followed by the last word correctly received; the sender will immediately resume his message, beginning with the word indicated by the receiver. If nothing has been received, signal "R R;" the sender will then repeat all.

Error in sending.—Signal seven dots (- - - - - - -) rapidly and resume the message, beginning with the last word correctly sent.

Adjustment.—If the receiver sees that the sender's mirror needs adjusting, he will turn on a steady flash until answered by a steady flash. When adjustment is satisfactory the receiver will acknowledge, and the sender will resume his message.

End of address.—Signal the period (- - — — - -).

Signature follows.—Signal "Sig."

To acknowledge receipt of a message.—Signal "O K," followed by personal signal or initial of receiver.

CONVENTIONAL SIGNALS FOR TELEGRAPH.

To call a station.—Signal the "call letter" of the station required until acknowledged, signing at intervals the "call letter" of the station calling.

To acknowlege a call.—Signal "I" three times, followed by call letter of acknowledging station.

To break or stop the signals from the sending station.—Open the key.

To start the sending station after breaking.—Signal "G A," followed by the last word correctly received; the sender will immediately resume his message, beginning with the word indicated by the receiver. If nothing has been received, signal "R R;" the sender will then repeat all.

Error in sending.—Signal seven dots (- - - - - - -) rapidly and resume the message, beginning with the last word correctly sent.

End of address.—Signal the period (- - — — - -).

Signature follows.—Signal "Sig."

To acknowledge receipt of message.—Signal "O K," followed by personal signal or initial of receiver.

MESSAGES BY FLAG, HELIOGRAPH, TELEGRAPH, ETC.

The following will be the order of transmitting the several parts of a message: 1st, number of message and "call letter" of sending station; 2d, operator's personal signal; 3d, the check; 4th, place from and date; 5th, address in full; 6th, period (address complete); 7th, body of message; 8th, Sig. (signature follows); 9th, signature.

EXAMPLE.

The message—

"Washington, D. C., January 1, 1888.

"John Smith,
"80 State street, Boston, Mass.

"Sent goods by express.

"Thomas Adams."

Would be sent—

No 2 W Jo 4 pd Washington D C 1 To John Smith 80 State street Boston Mass. Sent goods by express Sig Thomas Adams

Abbreviations should not be used in the body of a message, and numbers occurring therein must be spelled out in full.

The interest of the *militia* in matters relating to signaling continues unabated. Applications for information are frequent, and indications are conclusive that the National Guard of the country will in due time be capable of attending to its own means of communication. As set forth in previous report, requests for equipments could not be complied with under the law, a fact much to be regretted, as it is essential that not only methods, but equipments, should conform to those of the regular establishment. In order to give information of the customs and practices in the Army, instructions, new code cards, blank forms, etc., are freely furnished, and there seems to be no good reason, since the office is empowered by law to make issue of the equipment and apparatus to the National Guard of the District, why it should not also be legally authorized to make similar issues to the National Guards of the various States.

The law relating to the issue of equipments to the District militia reads as follows:

"That the uniforms, arms, and equipments of the National Guard (District of Columbia) shall be the same as prescribed and furnished to the Army of the United States. Every organization of the National Guard shall be provided with such ordnance and ordnance stores, clothing, camp and garrison equipage, quartermaster's stores, medical supplies, and other military stores as may be necessary for the proper training and instruction of the force and for the proper performance of the duties required under this act. Such property shall be issued from the stores and supplies appropriated for the use of the Army, upon the approval and by the direction of the Secretary of War, to the commanding general, upon his requisitions for the same. The property so issued shall remain and continue to be the property of the United States, and shall be accounted for by the commanding general at such times, in manner, and on such forms as the Secretary of War may require." (Section 31, act approved March 1, 1889.)

In consequence of the foregoing law, requisitions of the general commanding the District militia have been duly honored.

In the *New York* militia it is proposed to still further stimulate interest in signaling by the classification of men according to merit and distinguishing the more expert by a medal or decoration. An officer of the regular Army has been designated to assist the Governor in the establishment of a signal corps in each of the four brigades, and it is evident from the interest evinced that the troops of this State soon will be, if they are not already, possessed of several bodies of trained signalmen. The excellent achievements of the signal corps of the Second Brigade have been previously mentioned.

In *California*, each general officer and each regimental commander has a signal officer as a member of his staff. Regimental commanders are authorized by act of legislature to organize a body of signalmen, consisting of not more than two men to each company. Four regiments have such bodies drilled with flag and torch. The abolition of regimental signalmen and the organization of brigade signal corps is under discussion.

In *Colorado*, the law does not provide for the organization of a separate signal corps, but, realizing the importance of the service, a detachment of an officer and ten men has been detailed and receives weekly instructions from an officer of the Army.

Massachusetts has two signal corps (attached one each to the two brigades), each composed of one officer and twenty-five men. Their equipment consists only of the appliances of by-gone times.

In *New Jersey*, the State has provided officers for the superintendence of the signal service, but as yet no action has been taken to organize a corps.

The adjutant-general of *North Carolina* has recommended in his annual report the esblishment of a signal corps, and several other States are making efforts in the same direction.

Translations of books, pamphlets, and reports from abroad have been continued during the year, and experience gained by direct inspection of appliances and methods in foreign countries by agents of the Government.

The office not only keeps itself informed on subjects affecting communications in the field at home, but devotes much energy to gathering from abroad intelligence on all matters which bear either directly or indirectly upon the subject. As the collection of information in the field is one of the chief offices of the signal corps in time of war, it is natural that it should include in its duties in time of peace the functions of a bureau of military information.

I am, very respectfully, your obedient servant,

R. E. THOMPSON,
First Lieutenant, Sixth Infantry, Signal Officer.

The CHIEF SIGNAL OFFICER.

APPENDIX 2.

REPORT OF THE OFFICER IN CHARGE OF THE FORECAST DIVISION.

WASHINGTON, D. C., *July* 3, 1889.

SIR: I have the honor to submit the following report of work done in the forecast division during the year ending June 30, 1889.

The system of making two forecasts a day, based on the 8 a. m. and 8 p. m. telegraphic reports, instead of three a day, as during previous years, went into effect July 1.

During July, 1888, the forecasts were made for a period of thirty-six hours in advance. Since that time they have been made for a period of twenty-four hours in advance. The official designation of the predictions was changed June 1, 1889, from indications to forecasts.

The regular twenty-four hour synopsis has been issued daily, except Sundays and legal holidays, at the 8 a. m. report.

The regular twice-daily forecasts, for forty-one separate States and districts, have been issued throughout the year, except that on the mornings of Sundays and legal holidays the detailed forecasts by States have been omitted and only a general prediction made for the whole country.

Since May 1, 1889, there have been issued, when the conditions warranted, long-time forecasts, covering a period of two or three days in advance.

The Monthly Weather Crop Bulletin was issued by this division for the months of October, November, and December, 1888, and January and February, 1889.

Storm warnings to the lake, seacoast, and Canadian stations, warnings of frost to the sugar, fruit, cranberry, and tobacco districts, and warnings of cold waves, northers, and dangerous floods to the threatened districts have been issued whenever the conditions justified them.

A cablegram has been sent each night during the year to, and at the expense of, the French meteorological bureau, Paris, containing certain meteorological data obtained from the reports of incoming vessels, together with the position of areas of high and low pressure as shown by our 8 p. m. observation, and the pressure and wind at 8 p. m. at two Canadian stations.

The system of distributing forecasts by means of special messages to observers and others at central points, to be by them distributed to other points in their respective localities, has been continued throughout the year, an average of about seventy messages having been sent daily.

Special telegrams to individuals, giving forecasts for certain specified localities and dates have been sent whenever requested, at the applicant's expense.

The work of preparing forecasts has been performed during the year by the following officials, viz: 1888, July, Assistant Professor Hazen; August, Lieutenant Craig; September, Lieutenant Dunwoody; October, Professor Abbe; November, Lieutenant Dunwoody; December, Assistant Professor Hazen; 1889, January, Captain Craig; February, Lieutenant Thompson; March, Assistant Professor Hazen; April, Captain Allen; May, Lieutenant Dunwoody; June, Assistant Professor Hazen. Since December 1, 1888, the cold-wave-signal orders, and since May 1, 1889, the river forecasts have been prepared by Assistant Professor Russell.

Very respectfully,

R. E. THOMPSON,
First Lieutenant, Sixth Infantry, Signal Officer and Assistant, Forecast Official.

The CHIEF SIGNAL OFFICER, *Washington, D. C.*

STATEMENT SHOWING DUTIES OF FORECAST OFFICIAL AT A. M. AND P. M. REPORTS.

Average time at which the telegraphic reports are all in, 9.31 a. m. and p. m.

Time at which forecasts are required to be completed and furnished to the printer, 10.20 a. m. and 10.35 p. m.

A. M. Report.

Study of reports from 153 stations covering the entire territory of the United States, Canada, and the Northwest Territory.

Drawing of isobars and isotherms for said territory and making tracings of the same for the lithographer.

Preparation of synopsis of weather conditions prevailing over the United States for the preceding twenty-four hours.

Predictions for succeeding 24 (and at times for 36 and 48) hours for 41 separate States and districts, three elements, weather, wind, and temperature, in each prediction.

Study of probable wind conditions and ordering of signals, if necessary, at 60 display stations and districts in the United States and 17 in Canada, embracing the Great Lakes, the Gulfs of St. Lawrence and Mexico, and the eastern seaboard of the United States.

Sending of warnings of approaching storms to 9 separate addresses.

Study of probable occurrence of frosts and sending warnings, if necessary, to 33 different addresses, embracing the tobacco, sugar, cranberry, and fruit and vegetable regions of the United States.

Sending warnings of the approach of northers to 12 different addresses in the West and Southwest.

P. M. Report.

Same duties as at a. m., except that the synopsis is omitted, and in addition the official prepares the cablegram to the French meteorological bureau, Paris, containing certain marine and continental data.

In addition to the above the following duties were formerly required of the forecast official, viz: The study of reports from 24 river stations on 8 different rivers in the United States, and the making of predictions of the probable river changes and the study of approaching cold-waves and the ordering, if necessary, of cold-wave signals at 104 stations and the sending of cold-wave warnings to 24 separate addresses in 37 separate States and Territories.

APPENDIX 3.

REPORT OF THE OFFICER IN CHARGE OF THE VERIFICATIONS OF INDICATIONS.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington, D. C., *September* 6, 1889.

SIR: I have the honor to submit the following report of the verifications of indications for the year ending June 30, 1889:

The old instructions under which the daily predictions had been made and the rules for determining the verifications were changed at the first of the year so as to adapt their principles to predictions for thirty-six hours. At the same time the daily observations were reduced from three to two in number, taken at the hours of 8 a. m. and 8 p. m., seventy-fifth meridian time. At the close of July the predictions for thirty-six hours were discontinued, owing to the impracticable nature of such work at times of unsettled weather conditions, and for the remainder of the year predictions were made for twenty-four hours, those based upon the 8 p. m. map only being verified.

In this way a number of important changes have been introduced in the indications work, in consequence of which the results for the past year tend to differ more or less from those of previous years. The prediction of wind force has been omitted from the daily indications, and the predictions of wind direction, although still retained, are not verified, both these elements being provided for in the much more important work of the display of wind signals.

From December to April, inclusive, the cold-wave phenomena were studied and predictions made by one person, the regular indications official being relieved of this portion of the work. The rules by which these predictions are verified charges the official for the omission of a signal when a cold wave occurs that is not predicted, and, as such a rule has not applied in previous years, former percentages, as might be expected, are frequently higher.

The fundamental principles upon which the verifications are made are preserved as simple and elemental as possible, and perhaps from this very fact are more or less defective; and in view of the considerable area for which a prediction may be made and the diversity and complexity of conditions that sometimes follow, the verifications as per rule may fail in greater or less degree to indicate in proper measure the particular merit of the prediction in question. Though such cases would tend, in the main, to be eliminated from averages, yet considerable inaccuracy must exist on this account.

Some of the more important definitions and interpretations are briefly as follows:

Fair weather indicates absence of rain-fall.

A prediction of rain implies that rain will fall throughout about seven-tenths or more of the district area as shown by the maps of the two observations following. Light rain or local rain indicates an extent of precipitation about half as great as that comprehended under "rain."

Higher and lower temperatures indicate plus and minus changes, respectively, occurring over the entire district by the end of twenty-four hours from the observation on which the prediction is made.

Stationary temperature indicates changes of 3 degrees or less in the summer months, 4 degrees or less in the spring and fall, and 5 degrees or less in winter.

The tables following present in detail the various percentages for the year.

The markings up to the 10th of April were made by myself; after that time by the assistance of Mr. H. E. Williams, for whom was prepared a table of markings for typical conditions, and which served to guide him in determining the markings which, in this way, have been preserved, for all practical purposes, relatively the same as if all had been prepared by one person.

In comparing any monthly percentage with another it must always be kept in mind that each month carries with it peculiar weather conditions for which forecasts may have been much easier or much harder to make than for other months, and though one month's percentage may be lower than another, it may actually represent better work. Such is particularly the case with percentages of justification of storm-wind signals; a matter more particularly brought out in the general monthly averages for eight years, as published in the annual report for last year, table 2, page 60, the summer months being about 30 per cent. lower than the winter months. This striking difference is not so noticeable in the year just past, the percentages not only being higher than in the past but being more nearly the same for the different months. In questions of simple weather and temperature predictions, though conditions are known to be more favorable one month than another, yet it does not appear that all Januarys, for example, are any more nearly alike than one January is like another month of the year; at least any difference that may exist is not so strikingly identified with the particular month as to warrant the establishment of a system of weights on assumptions that all months of the same name are alike. Even in the case of the percentages for wind signals where the differences are more striking, great difficulty is experienced in devising any really rational system of weights.

Owing to the peculiarity noted above of the percentages of wind signals for 1889, being nearly the same for all months, an attempt to compensate the effect for particular months by applying a monthly correction determined from the eight years' averages results in raising to an unreasonable extent the percentages for the summer months. The various percentages are, therefore, submitted without alteration.

A more radical change was made at the beginning of the year in the subject of verification of cold waves than of any other element. Note is taken of the number of severe cold waves that occur without signals. This, when there is any doubt in the mind of the official as to the possible occurrence of a cold wave, does not, as was the case with the old rules, permit him to evade a decision, and order signals only when almost certain of their justification, but requires him to decide between a non-verified signal or a cold wave without a signal.

From back records of the office a list has been prepared of the severe cold waves without signals that occurred during October, November, and December, of 1887, and January, February, March, and April, of 1888; the total number being 925. Although the data are not strictly comparable with those for the past year, yet the difference is only slight, and the great improvement in the work in this respect is very marked.

Percentages of verifications of indications for the year ending June 30, 1889.

States.	1888.						1889.						
	July.*	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Average.
Maine	75.0	72.6	83.3	76.3	84.4	80.6	84.4	79.5	79.5	81.7	74.5	74.5	78.9
New Hampshire	78.2	73.4	80.3	75.8	88.7	82.4	87.0	80.7	78.1	80.0	73.5	73.0	79.2
Vermont	80.3	75.1	80.3	73.9	80.3	80.8	83.8	83.8	79.6	75.9	80.8	72.1	78.9
Massachusetts	76.5	80.7	80.5	75.5	82.2	85.2	83.4	85.2	81.7	80.9	83.2	77.2	81.0
Rhode Island	77.5	85.5	78.9	77.4	85.8	83.5	84.9	84.6	83.7	80.5	83.4	72.7	81.5
Connecticut	78.4	84.8	76.1	78.2	83.1	84.7	85.6	83.0	85.6	80.4	82.9	75.1	81.5
Eastern New York	79.0	77.5	81.5	75.5	78.8	79.7	84.8	82.0	77.7	79.9	79.7	71.7	78.9
Western New York	84.6	77.2	84.5	73.0	76.9	79.7	80.8	76.5	74.6	80.1	83.2	73.6	78.7
Eastern Pennsylvania	79.2	84.5	83.6	74.6	83.4	85.5	90.8	80.6	82.1	81.0	81.6	78.5	82.1
Western Pennsylvania	87.8	79.4	80.5	67.5	81.3	78.9	84.8	72.5	72.8	78.1	83.4	75.9	78.1
New Jersey	78.6	84.3	81.1	77.3	81.5	87.7	88.2	78.1	83.2	81.2	82.6	74.7	81.5
Delaware	80.6	89.0	80.1	76.1	84.9	90.7	88.6	80.1	81.1	75.0	85.2	78.2	82.5
Maryland	78.7	85.2	77.6	74.8	84.7	89.0	90.2	78.1	80.3	71.4	82.7	81.1	81.0
District of Columbia	84.3	81.0	76.5	77.0	86.5	89.1	90.6	78.0	83.4	70.9	90.4	77.2	81.2
Virginia	84.8	83.2	80.5	78.0	87.1	86.6	91.4	78.2	80.6	75.5	87.0	79.3	82.7
North Carolina	87.7	79.0	85.9	83.0	88.8	90.7	87.8	86.6	83.4	75.7	89.7	80.7	84.9
South Carolina	87.7	77.3	84.1	85.7	88.8	91.7	86.0	86.6	86.0	78.4	94.2	75.1	85.1
Georgia	85.7	72.5	82.4	84.3	84.5	91.8	83.7	84.2	86.3	78.9	92.8	76.4	83.6
Eastern Florida	90.1	78.0	85.1	76.0	86.1	82.3	84.8	79.2	87.5	87.7	92.8	81.9	84.3
Western Florida	84.2	72.6	75.3	74.8	80.6	83.5	83.6	76.6	90.8	92.8	93.9	82.1	82.5
Alabama	82.8	74.6	85.7	80.6	86.7	87.2	84.1	79.5	88.0	90.7	94.5	77.5	84.3
Mississippi	81.0	72.7	85.3	78.1	87.1	83.5	81.8	80.7	84.1	87.5	94.3	75.3	82.6
Louisiana	82.3	73.3	79.9	74.5	90.1	82.8	86.5	80.1	84.1	87.1	88.9	79.1	82.4
Texas	88.5	83.2	84.4	77.3	86.7	88.1	84.9	77.1	71.7	81.7	89.7	77.3	82.1
Arkansas	83.4	70.6	85.7	78.8	83.1	87.3	88.3	85.7	79.2	79.1	88.4	75.4	82.1
Tennessee	84.2	77.5	90.6	74.0	84.9	86.8	80.6	84.7	81.2	81.3	90.3	72.0	82.3
Kentucky	86.8	78.5	83.7	76.9	79.6	84.0	81.9	83.4	80.4	79.5	85.4	69.9	80.8
Ohio	89.0	81.4	81.1	67.0	79.9	76.6	81.7	79.4	73.4	73.4	82.5	81.1	78.9
West Virginia	86.8	80.5	78.7	68.2	80.0	82.7	85.6	75.1	71.4	72.4	85.5	72.1	78.3
Indiana	88.9	76.5	83.3	74.8	77.3	81.4	88.2	77.8	75.2	82.0	80.0	77.6	79.8
Illinois	86.2	75.4	81.5	75.1	83.8	82.1	85.5	80.4	75.2	81.2	75.5	78.6	80.0
Lower Michigan	82.7	75.1	82.1	76.5	83.2	81.7	81.9	78.5	72.5	78.7	79.7	76.9	79.1
Upper Michigan	83.4	79.5	73.7	74.5	84.3	78.8	88.4	76.9	70.7	78.1	73.0	69.3	76.3
Wisconsin	83.1	79.5	81.3	73.2	88.1	85.1	81.5	76.4	80.3	81.9	73.3	77.3	80.1
Minnesota	83.2	73.0	82.0	71.9	85.3	84.1	82.7	77.5	77.5	76.1	79.4	76.8	79.1
Iowa	83.4	74.3	80.2	74.4	83.3	86.7	81.9	77.0	83.5	83.1	80.4	83.7	81.0
Kansas	83.5	76.2	83.9	71.7	86.0	89.0	87.2	79.0	77.5	76.1	81.9	76.9	80.0
Nebraska	82.1	79.5	83.9	76.1	89.9	85.8	83.5	80.9	83.5	77.9	82.6	79.9	82.1
Missouri	80.4	73.1	78.2	78.8	83.9	83.5	88.1	80.1	78.8	80.5	81.0	78.1	80.4
Colorado	82.0	77.2	87.1	71.0	85.5	88.0	82.1	79.4	78.1	78.7	79.9	76.9	80.5
Dakota	80.5	77.4	87.7	74.2	87.7	82.4	78.5	79.9	81.9	77.9	78.7	78.7	80.5
Weather	90.0	82.0	83.6	80.5	85.6	87.3	87.0	81.4	86.5	84.0	86.2	80.6	84.4
Temperature	72.7	72.2	79.4	68.4	82.2	80.2	81.6	78.0	70.7	73.3	80.0	70.6	75.8
Weather and temperature combined	83.1	78.1	81.9	75.7	84.2	84.5	84.8	80.0	80.2	79.7	83.7	76.6	81.0
Pacific coast.													
Southern California	87.5	(†)	84.4	93.7	89.3	90.7	95.2	87.4	86.4	89.5	85.5	93.3	89.4
Northern California	88.0	(†)	85.3	91.9	88.9	84.4	83.9	81.5	89.0	84.9	78.1	90.2	86.0
Oregon	78.6	(†)	82.1	78.1	78.9	73.5	83.6	69.4	80.6	78.8	83.6	88.2	79.6
Washington Territory	77.8	(†)	82.6	77.9	78.0	77.4	81.1	74.6	85.4	79.7	79.7	87.7	80.2
Weather	94.8	(†)	94.8	88.5	88.0	86.3	87.6	86.7	92.0	90.8	89.1	96.8	90.5
Temperature	65.3	(†)	66.8	80.7	77.5	74.3	83.5	64.1	75.5	72.0	70.6	79.5	73.6
Weather and temperature combined	83.0	(†)	83.6	85.4	83.8	81.5	86.0	78.2	85.4	83.3	81.7	89.9	83.8

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*The percentages for July include an addition of 8 per cent. to the official percentages to compensate for the longer period for which the predictions were made, viz: For 36 hours instead of 24 hours, the period predicted for during the rest of the year. The Pacific coast percentages are, however, excepted from this addition, owing to the conditions in that region being so much more favorable than elsewhere for longer time predictions.

†No predictions.

Percentages of justifications of wind signals for the year ending June 30, 1889.

Month.	Total number ordered.	Justified as to velocity.		Justified as to direction.	Cautionary.			Storm.			For easterly winds.		For westerly winds.		Number of winds without signals.	Number of signals ordered late.	Percentage of justifications.
						Justified as to velocity.			Justified as to velocity.								
		Wholly.	Partly.		Ordered.	Wholly.	Partly.	Ordered.	Wholly.	Partly.	Ordered.	Justified.	Ordered.	Justified.			
1888.																	
July	21	16	2	21	19	14	2	2	2	......	1	1	20	20	12	6	63.7
August	29	15	6	28	11	3	2	18	12	4	18	18	11	10	33	3	52.5
September	63	41	......	59	49	31	......	14	10	......	36	33	27	26	30	3	60.8
October	173	87	6	157	169	84	6	4	3	......	84	78	89	79	23	10	62.0
November	143	94	10	120	115	70	8	28	24	2	75	57	68	63	26	13	68.2
December	92	59	13	87	60	35	7	32	24	6	29	26	63	61	17	8	72.4
1889.																	
January	95	66	5	89	40	21	3	55	45	2	39	36	56	53	18	10	71.6
February	56	33	5	49	20	8	2	36	25	3	12	9	44	40	28	3	57.7
March	105	71	8	97	66	42	4	39	29	4	62	54	43	43	25	9	69.7
April	128	87	9	120	95	62	6	33	25	3	77	69	51	51	14	10	74.6
May	116	87	8	110	108	82	6	8	5	2	58	57	58	53	12	11	78.6
June	44	24	2	43	44	24	2	......	......	......	23	22	21	21	19	7	57.1
Total	1,065	680	74	980	796	476	48	269	204	26	514	460	551	520	257	93	*67.3

* Yearly per cent.

Percentages of justifications of cold-wave signals for the year ending June 30, 1889.

Month.	Ordered.	Justified.		Per cent. of justifications.
		Wholly.	Partly, or 75 per cent.	
1888.				
July	0	0	0	....
August	0	0	0	....
September	0	0	0	....
October	132	39	1	30.1
November	185	120	2	65.7
December	273	185	10	52.2
1889.				
January	393	214	13	56.9
February	351	226	8	66.1
March	138	48	9	41.2
April	71	44	3	65.1
May	0	....	0	....
June	0	....	0	....
Total	1,538	826	46	55.9

NOTE.—During the year two signals were ordered late, *i. e.*, after a fall in temperature sufficient to have justified a signal had occurred, and 109 severe cold waves without signals occurred.

Percentages of forecast officials for the year ending June 30, 1889.

Officials.	Months.	Weather.	Temperature.	Monthly average.	Wind signals.	Average of all forecasts.
Captain Allen	April, 1889	84.0	73.3	79.7	74.6	78.2
Captain Craig	August, 1888	82.0	72.2	78.1	52.5	70.8
	January, 1889	87.0	81.6	84.8	71.6	81.0
	Annual average	84.5	76.9	81.4	64.2	75.9
Captain Dunwoody	September, 1888	83.6	79.4	81.9	60.8	75.9
	November, 1888	85.6	82.2	84.2	68.2	79.6
	May, 1889	86.2	80.0	83.7	78.6	82.2
	Annual average	85.1	80.5	83.3	69.8	78.6
Lieutenant Thompson	February, 1889	81.4	78.0	80.0	57.7	73.6
Professor Abbe	October, 1888	80.5	68.4	75.7	62.0	71.8
Professor Hazen	July, 1888	90.0	72.7	83.1	63.7	77.6
	December, 1888	87.3	80.2	84.5	72.4	81.0
	March, 1889	86.5	70.7	80.2	69.7	77.2
	June, 1889	80.6	70.6	76.6	57.1	71.0
	Annual average	86.1	73.6	81.1	67.8	76.7
	Pacific coast.					
Lieutenant Maxfield	July, 1888	94.8	65.3	83.0	....	....
	August, 1888*	....	....	....	....	....
	September, 1888	94.8	66.8	83.6	....	....
	October, 1888	88.5	80.7	85.4	....	....
	November, 1888	88.0	77.5	83.8	....	....
	December, 1888	86.3	74.3	81.5	....	....
	January, 1889	87.6	83.5	86.0	....	....
	February, 1889	86.7	64.1	78.2	....	....
	March, 1889	92.0	75.5	85.4	....	....
	April, 1889	90.8	72.0	83.3	....	....
	May, 1889	89.1	70.6	81.7	....	....
	June, 1889	96.8	79.5	89.9	....	....
	Annual average	90.5	73.6	83.8	....	....

* No predictions.

Respectfully submitted.

C. F. MARVIN,
Assistant Professor, in charge verifications.

The CHIEF SIGNAL OFFICER.

APPENDIX 4.

REPORT OF THE OFFICER IN CHARGE OF THE STATE WEATHER SERVICE.

SIR: I have the honor to submit the following report relative to the operations of State weather services, and the local meteorological societies co-operating with the Signal Service, during the year ending June 30, 1889:

The State services previously organized have continued in operation during the year, and the services in New York, Oregon, and Colorado, which were previously supported largely through the liberality of the Signal Service, have been placed upon a more secure basis by legislative action whereby the services in these States have been regularly organized and money appropriated for their support. A service has been organized in Dakota during the year, those of Minnesota and Illinois have been re-organized, and for the purpose of securing reliable information relative to the effect of the weather upon growing crops the co-operation of voluntary observers in the preparation of the weather crop bulletin has been secured in Iowa and Virginia.

Including New England, which forms the field of operation of the New England Meteorological Society, there are at present thirty-one States which are receiving the benefits resulting from such local organizations, and the record of the past year is conclusive as to the practical value of State services to the people of the States in which they may be organized, to the public generally throughout the United States, and to the national weather service.

The local services are attracting the attention of thousands who are interested in weather reports, and they are building up a large corps of efficient voluntary observers who are performing commendable work. Many of these observers manifest great interest in collecting reports and distributing information furnished them from the director of the State service or from this office, and through the efficient and voluntary work of these observers the public is becoming better educated, and is therefore receiving increased benefits from the reports, forecasts, special warnings, and bulletins issued by the Signal Service.

The directors of the State services have, in compliance with your request, submitted reports showing the operation of the State services during the year, together with some accounts of the benefits resulting to the varied interests of the States from such organizations. It is to be regretted that these reports can not be published in full, as they contain much information which must necessarily be omitted from the synopsis report.

Your attention is respectfully invited to the following extracts from the annual reports of the directors of State services:

ALABAMA.

[P. H. Mell, observer, Signal Corps, director.]

The regular monthly bulletins have been issued and distributed to all parties in the State interested in the work. Most of the newspapers have republished the conclusions drawn from the observer's report, and have thus given to every one who reads the paper the important facts submitted by the bulletins.

During the crop season, from May 1, to October 1, weather crop bulletins have also been issued regularly each week. These have been distributed in the same manner by which the monthly publications have been sent out. The information contained in these weekly bulletins being in such a condensed form, and so valuable to all interests of the State, the newspapers have, without exception, republished them entirely, and the agent of the United Press dispatch has telegraphed them each week to newspapers and commercial centers in several of the neighboring States. The Financial and Commercial Chronicle, of New York, by special request has been receiving telegrams each Friday night, giving the facts contained in these bulletins for publication in that periodical.

There has been prepared during the year, and is now in the hands of the State printer, Special Bulletin No. 4, discussing the question of precipitation at several stations in the State where observations have been continued for a number of years.

Valuable information has been disseminated among the farmers of the State through the quarterly bulletin issued by the State experimental station. A department of meteorology has been established by this corporation and has been placed under my charge. A first-class meterological observatory is now being built in connection with the station, and all the necessary instruments will be placed in it as soon as it is ready to receive them.

The benefits accruing to the people of the State in the work performed by the Alabama weather service are many. Among the number may be mentioned, the prediction of cold waves enables the market gardener to protect tender plants in the early spring; the prediction of rain during the harvesting of grain permits the farmer to house or otherwise protect the portion that has been cut; if fair weather is assured during the growing season, the farmers are permitted to exert every energy to clear the crop of grass and place the soil in condition for the coming rains. The observations taken daily by the observers of the State, and extending over a period of years, will determine the climate for the benefit of parties who propose to settle in Alabama. Much valuable material has been collected to be used in the near future in advertising sections of the State.

The legislature has made no appropriation to sustain this service, and without the aid received from the Chief Signal Officer but little can be accomplished. The agricultural experiment station has been very liberal in equipping the station located at Auburn.

ARKANSAS.

[Director, Prof. John C. Branner, State geologist; W. U. Simons, observer, Signal Corps, assistant.]

The service has continued about the same class of work as that of the previous year. Prof. John C. Branner, State geologist, has remained in charge, and Sergt. W. U. Simons assistant. Reports have been received regularly from about thirty stations in the State for publication in the Monthly Weather Review, and reports for the Weekly Crop Bulletin from almost every county, and, in many cases, from two or more sections of a county. The expense of printing these reports has been borne either by the director or the assistant, or by the insertion of advertisements in the publications. During the year the indications have been telegraphed daily to an average of twenty points in Arkansas, and from July 1 to January 1 to five points in eastern Texas. Instruments from which to make reports have been loaned to observers at sixteen stations, and the service has generally been very satisfactory,

Ten sets of flags have been purchased during the year for stations receiving weather indications. Some of these flags were to replace worn-out ones, and some were to supply newly established stations.

These indications are of especial importance during the summer season in the prairie sections of the State during the hay harvesting, as they enable farmers to care for the cut hay before it is injured by rains. One planter cites not less than twenty cases where from 5 to 25 tons of hay had been saved by these forecasts. The fruit-growers take great interest in the indications sent out during the berry season, and pick the berries in a degree of ripeness to stand the character ot weather it is expected they will encounter in their transit to the markets of Saint Louis or Chicago.

The Weekly Crop Bulletin meets with very general approbation, and two hundred copies of it are sent out weekly from April 1 until December 1. One of the best known cotton-growers of the State says: "The most interesting article I saw in the daily papers while I was away last summer and fall was the Crop Bulletin. It kept me perfectly informed how the crop was doing at home." Another prominent planter says: "I post the Crop Bulletin up at my office as soon as it arrives, and the remainder of the day the office is crowded with friends who come in to read it." Another says: "The Crop Bulletin interests me as much as any paper I subscribe for." These are examples of the remarks made by the leading planters and business men of the State, and of the estimate placed by them upon these reports.

Thus far the State weather service has received no aid from the State government, but has been maintained without funds other than those contributed privately by the director or by the assistant. A bill was introduced in the last legislature to provide for maintaining a State service at an annual expense of $500, but it failed to pass, for it was supposed that the bill providing for a State agricultural bureau would make provisions for the weather service. Although no such provisions were made directly, it is hoped that the agricultural bureau will assume charge of the publication of the State Service at an early date. To this end the present director has placed his resignation in the hands of the governor.

COLORADO METEOROLOGICAL ASSOCIATION.

[Prof. F. H. Loud, director; T. W. Sherwood, observer, Signal Corps, assistant.]

The excellent bulletin of this association indicates the high character of the work performed by that service. The advantages of this service to the State have been recognized by the legislature of the State, which last winter made an appropriation for its support. The large number of rainfall stations established by this service will prove of special value in the discussion of the irrigation problem in that region. In this connection valuable information has already been supplied to the officials of the Geological Survey now investigating the subject of irrigation, and arrangements have been made to co-operate with these officials by largely extending the number of rainfall observers.

DAKOTA.

[Samuel W. Glenn, observer, Signal Corps, director.]

This service is wholly operated by the observer of the Signal Service, aided by voluntary observers and crop reporters, the necessary instruments having been furnished by the Signal Service. Sergeant Glenn in his report states that an important factor in the work of the State service is the Weekly Crop Bulletin. It is compiled from weekly reports furnished by over one hundred practical farmers located at points throughout the Territory. The bulletin was started March 9, 1889, and will be continued until September 15. The issue has increased as the result of actual demand, from 75 to 225 copies weekly. It appears in two daily, three weekly, and two monthly papers published in Huron, one daily published in Sioux Falls, two dailies published in Saint Paul, Minn., and a number of weeklies published from different points in the Territory.

The accompanying letter from the Hon. F. H. Hagerty, commissioner of immigration for Dakota, relative to the bulletin, is submitted:

"ABERDEEN, *July* 6, 1889.

"DEAR SIR: I beg to acknowledge with thanks the receipt of your Weekly Crop Weather Bulletin, which, compared with information received by this office from other sources, proves to be most accurate and complete, and which I consider a most important factor in advancing commercial and farming interests. Permit me to congratulate you upon the efficiency with which you compile the same, and kindly favor this office with copies of your future publications, as well as with your very valuable statements of summaries of observations taken at your station.

"I am, sir, yours very truly,

"F. H. HAGERTY,
"*Commissioner.*

"S. W. GLENN, Esq.,
"*Director Dakota Weather Service, Huron, Dak.*"

The daily indications or forecasts of the Signal Service are telegraphed to twenty places in the Territory, and there is every reason to believe that they are duly appreciated. The cold-wave warnings receive universal attention, and seldom go unheeded. The high percentage of verification has established confidence in them. If the appropriation for the purpose will permit, a number of stations to display cold-wave flags only could, I think, be established, and with great benefit to the people.

ILLINOIS.

[John Craig, observer, Signal Corps, in charge.]

From June 30, 1888, to February 1, 1889, this service was, and had been for ten years, under the control and support of the State board of agriculture, Col. C. F. Mills, as director most of the time. A regular monthly report was published at the expense of the board up to and including January, 1889. At a meeting of the board of directors held February 25, it was decided that owing to the expense involved the Agricultural Department would withdraw its support and control from the service. On February 22 Sergt. John Cassidy, who had up to that time been stationed at Springfield as assistant to Colonel Mills, was accidentally killed, and in compliance with telegraphic instructions received from the Chief Signal Officer, Sergeant Craig assumed charge of the work so ably performed by Sergeant Cassidy.

The Illinois State weather service has therefore been under the management of the Signal Service observer at Springfield since February 23, and entirely supported by the Signal Service. The Weekly Crop Bulletin has been regularly issued during the growing season, and 215 copies have been distributed to newspapers throughout the State and to observers. The data used in making these bulletins are furnished by the voluntary observers, reports being received from about forty counties in the State. The weather forecasts and warnings are telegraphed daily, except Sundays, at the expense of the Signal Service, to the leading points in the State, and, as a general rule, have been highly appreciated by the citizens.

A monthly report compiled from data furnished by voluntary observers of the State has been made up and forwarded to Washington on the 15th of each month. Reports have been received, on an average, from about fifty observers.

INDIANA.

[Prof. Henry A. Huston, director; C. F. R. Wappenhans, observer, Signal Corps, assistant.]

Reports are received from thirty-seven observers, including railway temperature stations. Arrangements have been made for twelve additional stations as soon as rain-gauges are received.

The regular monthly bulletin of the service contains a short review of the weather conditions of the month, remarks by observers, tables showing observer's report of pressure, wind velocities, and direction, temperature, precipitation, general phenomena, and comparative tables of pressure and precipitation, of periods of from four to thirty-five years. During the year these comparative tables have been much extended, so that the tables now contain comparisons for twenty-five stations in place of nine for last year. The service also published a Weekly Crop Bulletin. This bulletin is re-published in full by the Indiana Farmer, and so reaches just the class of people desired. This part of the work is highly appreciated by the people of the State.

The work of displaying weather signals continues, and we have more applications for the telegrams than we can fill. The management of the service is now in the hands of the agricultural experiment station of Purdue University.

The success of the service is largely due to the prompt and efficient work done by Sergt. C. F. R. Wappenhans, who is detailed by the Signal Service to act as assistant.

In his report Professor Huston desires to acknowledge the value of the services rendered by the Indiana Farmer in extending the circulation of the Weekly Crop Bulletin, and also his indebtedness to the United States Signal Service for the use of instruments, for blank forms, assistants, telegrams, and other aid. Accompanying the report was a statement showing a list of observers, stations, instruments, etc., and a copy of the monthly bulletin giving a list of display stations, and a copy of the last Weekly Crop Bulletin.

IOWA.

[Weather crop bulletin service, George M. Chappel, observer, Signal Corps, Des Moines, Iowa, in charge.]

This service was established at the commencement of the crop year with a view of securing reliable reports as to the effect of the weather upon crops in this important section of the wheat and corn belt.

The experience of this service during the previous year in the preparation of the Weather Crop Bulletin clearly established the importance of receiving reliable reports from this State. The Weather Crop Bulletin had been issued during the two previous years with reliable reports from the surrounding States, while the conditions existing in Iowa could only be approximately stated from observations made in other States.

The Chief Signal Officer was of the opinion that the country at large should be informed, through the medium of the Weather Crop Bulletins, as to the weather conditions and the effect upon crops in all principal agricultural States, and therefore directed the observer at Des Moines to call upon the voluntary observers of the Signal Service to co-operate in this important work.

Mr. John R. Schaeffer, secretary of the State Agricultural Society, also rendered valuable aid in furnishing the names of reliable correspondents throughout the State. There are at present one hundred and thirteen voluntary observers, and the number of reports received each week will average ninety. These bulletins have been printed by the Daily News, of Des Moines, Iowa, and through the co-operation of the Commercial Exchange and the State Agricultural Society the weekly Bulletin is published in the daily and weekly papers of the State, including about six hundred periodicals. It has been most favorably received by the people and the press. Good citizens of all professions appear interested, and pronounce the bulletin by far the greatest success of the kind that they have ever known. The Iowa State Register, in referring to the bulletin, says: "It is the means of placing before the people prompt and reliable information relative to the condition of crops that will benefit the producer and the consumer alike."

In the organization of this important work the office is indebted to Mr. J. R. Sage, manager of the Iowa department of the Chicago Inter-Ocean, for valuable suggestions and assistance.

KANSAS.

[Professor J. T. Lovewell, director; T. B. Jennings, observer, Signal Corps, assistant.]

Reports are received at the central office from 97 observers, representing 72 counties in the State, 32 counties being yet unrepresented. From the geographical configuration of the State it has been found convenient to divide it into three portions: First, the eastern division, including 35 counties, wholly east of the ninety-seventh meridian. Second, the middle division, embracing 37 counties, west of the eastern division and east of the one-hundredth meridian. Third, the western division, which includes 32 counties, wholly east of the one-hundredth meridian. The names and locations of observers are given in tables accompanying this statement. The reports are compiled and published at the central station at Washburn College, Topeka. A monthly bulletin of 5,000 copies is issued each month and sent to every State in the Union, besides large numbers sent abroad. In connection with this a chart showing the distribution of rain is issued, and 250 copies distributed each month.

The Weather Crop Bulletins were issued weekly last summer until October 1, and were resumed April 6, and have been regularly issued since that date. About 500 copies are issued weekly; 250 newspapers in the State are supplied with it; 150 copies are distributed through the State to observers, to State and county officials, and the balance are sent to other States and to the Associated Press.

The quarterly and biennial reports of the State Board of Agriculture include the reports of the State meteorologist, which are compiled from the above-mentioned bulletins. "Indications" have been telegraphed daily at Government expense to well-distributed points, where they are published by the display of the usual flags. These forecasts are fully appreciated by the citizens of the State, but the peculiarities of the meteorological conditions are such that a greater benefit is derived from the cold-wave warnings. During the present season the displaymen have been requested to render reports to the central office so that a statement can be published monthly of these warnings.

There has been a steady development of the Kansas weather service since its organization. It has been wholly a voluntary work, except for the valuable aid it has received from the Signal Service, which includes not only the efficient co-operation of the assistant director, Sergt. T. B. Jennings, but also a liberal supply of blanks, franked envelops, office equipment, and many meteorological instruments.

The connection with the State Board of Agriculture has given great advantages in the publication and distribution of reports. There is still a wide and important field for enlargement before the Kansas weather service will have reached the full measure of its usefulness. The number of observers should be increased until at least every county is represented. The facts which are tabulated will increase in value and interest with their number and duration. The prevalance of hot, dry winds in certain sections of the State is recognized as the most destructive agency of crop failure, and it is, therefore, of the utmost importance to investigate the origin, limits, and causes of these winds. To gain information on this point the Kansas weather service, in co-operation with the U. S. Geological Survey, has issued a circular asking for reports of these winds.

The destructive tornadoes still need further study before their laws can be stated or geographical limits assigned. The irrigation problem, which the Senate committee is now investigating, can only be settled when we know what are the really arid portions of the country, and where we are to look for the water supply. Meteorological observations will certainly contribute to the solution.

In connection with the State service there will be an advantage in making barometric, wind, and electrical observations complete from as large a number of stations as possible.

With this increase of number and fullness of observations will come corresponding increase of labor in compiling and gaining the full value of these reports. To this end it is hoped that the state will not long delay to make requisite appropriations for accomplishing this work.

KENTUCKY.

[Dr. E. A. Grant, director; Frank Burke, observer, Signal Corps, assistant.]

This service has but recently been established and is but imperfectly organized. The State has made no provision to support or even to aid this important work. About a year ago the service was transferred to Louisville, and placed under the charge of the Polytechnic Society of Kentucky—a society organized for the cultivation and diffusion of knowledge, but receiving no aid from the city or State. The society assumed the charge and placed it under the direction of the committee on meteorology. An attempt was immediately made to secure a corps of competent voluntary observers, in order to obtain reliable weather and crop reports from every section of the State. This task has been more difficult than was at first expected. To find men who are competent and willing to make the necessary observations and reports has engaged the attention of the officers of the service; but too few have as yet been found. Thirty-two observers have been appointed. From some of these reports have been so irregular and inaccurate that they are useless, and these useless observers have been requested to return the instruments sent to them. The reports of others exhibit painstaking interest and care, and are all that could be expected from the limited number of meteorological instruments at the command of the observers, and are worthy of all praise. As must be expected, there are others whose reports are far from perfect, but the improvement from week to week is such as to give gratifying assurance of both zeal and accuracy.

Though the service is so imperfectly organized, enough has been accomplished to show its inestimable value and its boundless possibilities, and to secure for it many friends. One single warning sent out through this service last fall caused the saving of thousands of dollars to the tobacco growers of Kentucky. Had means been provided for sending this warning throughout the State, the value of the crops that might have been saved would have been sufficient to generously equip a State weather service for many years.

The weather and crop report prepared by this service is regularly published by most of the State papers and by some of the papers in adjoining States. Besides this, cyclostyle copies of the report are sent to representative men in various parts of the State and are highly appreciated by the recipients.

The great value of the forecasts and frost-warnings has aroused no little attention on the part of farmers and others who have, until recently, been indifferent towards the service. The forecasts sent to some of the State observers are sent by telephone and by special messengers on horseback to towns and neighborhoods in the vicinity, and they are posted in country stores and other conspicuous places. It is greatly to be regretted that these forecasts can not be more generously distributed.

The Polytechnic Society of Kentucky has temporarily assumed the cost of publishing the monthly weather bulletin, which is gratuitously distributed throughout the State.

Sergeant Burke, the local observer at Louisville, by request read a paper on the State weather service before the Commercial Club, which was published by order of the club. A copy of this paper is herewith.

[This report was read before the Commercial Club, June 11, 1889, and indicates the wide scope of the topics brought before and advocated by this organization, not only for the advancement of the city of Louisville, but for the general welfare of the whole State of Kentucky as well.]

"KENTUCKY WEATHER SERVICE.

"The daily press has familiarized most people with the reports and forecasts of the United States Signal Service. Comparatively few think—if they ever devote a moment's thought to the subject—that the scope of the work of the Weather Bureau extends beyond the preparation of these daily indications. But few realize the fact that the distribution of these forecasts is but a minor part of the duty of an observer. It will doubtless be a surprise to many of the business men of Louisville, when they are told that at the United States signal office in this city are received daily full and complete weather and river reports from every section of the United States, and that they are sent here at great expense, for the sole utility of the commercial interests of this city.

"In other great commercial centers—notably, Chicago, New York, Boston, New Orleans, and Cincinnati—the Signal Service maps and bulletins, posted each morning at the different boards of trade and chambers of commerce, are considered to be a most important element in the transaction of such classes of business as are affected by changes in the weather. The weather map, published at the Chicago Board of Trade, frequently determines the grain and produce quotations.

"Some of our own business men, from past experience, have learned the value of this information, and have frequently saved themselves great pecuniary loss by consulting the reports. There are produce merchants here who will testify to the fact that a single timely cold-wave warning has saved them thousands of dollars, by delaying the shipment of perishable goods.

"Grain, cotton, and tobacco speculators know the value of accurate reports of rain-fall in the great agricultural districts; and to the 'rivermen,' a knowledge of the depth of the river at different points on the stream, and its probable fluctuation, has become indispensable.

"Many other industries might be cited, in the conduct of which a knowledge of weather conditions is an important element.

"Until a comparatively recent date the benefits of the Signal Service have been confined to the larger cities; but through the medium of State weather services, the usefulness of the National Weather Bureau is being rapidly extended to the people living at a distance from the centers of population; and the main object of this paper is to show to the Commercial Club the necessity and benefit of such a service, thoroughly organized, in Kentucky.

"In twenty-nine of the States these organizations are in successful operation. They have been fostered by various scientific societies, and in many instances have been organized under a State law, and wholly, or in part, maintained by appropriations from the respective States. In other cases, as in Texas, Oregon, and Indiana, the associations have been under the auspices of public-spirited exchanges or boards of trade, which are interested in extending a knowledge of the climatic and meteorological conditions of their sections.

"The Chief Signal Officer has pursued towards these organizations a most liberal policy of hearty co-operation, which has been limited only by the appropriations and the requirements of law. He tenders now to Kentucky the use of accurate instruments to reliable persons at selected points in the State, with all necessary stationery and postage free to correspondents and observers.

"In States where such services have been in operation for the past few years, their value has been such that they are now almost indispensable to the people. The cost of maintaining them is insignificant when compared with the resulting benefits; and it is only through such an organization that the farmers of this State will be able to utilize the benefits of the Signal Service.

"Millions of dollars may be saved annually by a wide distribution of weather forecasts in the agricultural districts, and there are cases on record where a single warning has enabled individuals to save crops of tobacco, sugar cane, and other products valued at hundreds of thousands of dollars. Last year, when the early frosts created such havoc with the tobacco in some parts of Kentucky, a warning was received at the signal office here, which, had the proper facilities existed for its distribution, could have been sent to all parts of the State forty-eight hours in advance of the coming of the frost.

"The expense of telegrams conveying such warnings is borne by the National Weather Bureau, and the number of points to which they are sent is limited only by the appropriation.

"In this connection it may be stated that the Commercial Club, during the coming fall, will be requested to furnish a list of reliable persons in the tobacco districts, to whom such warnings will be telegraphed.

"Comments upon a service, which can accomplish the results referred to, are needless; its value is manifest to any intelligent person. The Kentucky State weather service was organized about a year ago under the auspices of the Polytechnic Society, and, despite many difficulties with which it has had to contend, its work has attracted wide attention throughout the State. It has at present a corps of 25 observers, whose records contain valuable information regarding the climatology of different parts of the State. In addition to these there are in the State 100 crop correspondents, who report weekly the condition and progress of the crops in their respective sections, to the central office in this city, where the information thus collected is summarized, and is afterwards published in the leading papers of the State.

"Twenty-five towns in the State are now receiving daily indications, cold-wave and frost warnings, the expense of the telegraphing of which is borne by the Government.

"It is desired to further extend this service, and the Commercial Club is asked and urged to lend its support and co-operation to it; and at the next session of the legislature to use its influence to obtain an appropriation adequate to meet the necessities of the service, and place it upon such a footing that it will at least compare favorably with similar services in adjoining States.

"FRANK BURKE,
"*Sergeant in charge Signal Service Station.*

"LOUISVILLE, KY., *June* 11, 1889.

"On motion of Mr. John S. Morris the above was ordered printed for general information and circulation, and the committee on State development instructed to take up and further the suggestions outlined therein.

"THE COMMERCIAL CLUB,
"*Louisville, Ky.*"

LOUISIANA.

[R. E. Kerkam, observer, Signal Corps, director.

The bill for the support, equipment, and maintenance of the Louisiana service failed to become a law by 3 votes, after it had passed to its third reading. There was no real objection to the bill, but it was the fact that there were no funds in the State treasury, and also that the showing made by a service barely six months old was not such as to impress the necessity for State support. Its supporters, however, propose to again urge the bill at the coming session of the State legislature, when indisputable facts will be brought forward to show the necessity for State support; and the great benefit derived from the State service during the past year must result in favorable legislation,

The publication of the monthly data, reported by observers, has been solely through private enterprise in the issue of the monthly Meteorological Journal, the cost of printing having been defrayed by advertisements and subscriptions. The paper has been a success from a financial standpoint, sufficient funds having been realized to pay the incidental expenses of the office, and to purchase a number of sets of instruments to replace those broken and unserviceable, and to open new stations. The issue of a few sets of instruments from the office of the Chief Signal Officer to certain volunteer observers has also aided in increasing the number of stations of observation which at this date is fifty-six, an increase of fifteen since July 1, 1888.

The State is now very thoroughly covered, excepting a few parishes in the interior beyond the reach of railway or steam-boat lines. The stations, with but few exceptions, are supplied with the self-registering maximum and minimum thermometers, exposed thermometer, and a standard rain-gauge, all instruments purchased by this office from Messrs. Green, of New York, and Queen, of Philadelphia, having been of standard signal-service make. The great majority of reports received from observers show a gratifying improvement in the manner of making observations and in their completeness. There are, however, a number of stations having incomplete sets of instruments, and it is respectfully suggested that this office be supplied with a few sets of self-registering thermometers to be issued under personal bonds to complete certain sets.

The State press has taken an active interest in the work of the service by publishing regularly the weekly weather-crop bulletins and local summaries furnished them by the parish observers, and this portion of the work has had the effect to bring the work of the service prominently before the people of the State, creating a wide-spread interest.

The railroads have utilized the monthly Meteorological Journal in advertising the State's climatology, thousands of copies having been distributed in the Northern and Western States, resulting in attracting a great number of immigrants to this State. The several immigration conventions held in various portions of the State during the past year were supplied with statistics compiled from the records of this office, and the proceedings of the conventions were published in pamphlet form, and judiciously distributed throughout the entire country. The special immigration editions of the press were also supplied with statements as to the climatology of the State, and the work of this office in this particular alone has been of untold benefit to the State.

Owing to the poor telegraphic facilities in Louisiana, the daily weather forecasts do not receive much of a dissemination. It is certainly important to the agricultural interests to have these forecasts, but when the telegrams sent from Washington do not reach the displayman until 9 a. m. of the following day, it can readily be seen that the benefit to be derived from these telegrams is lost. It would be far better to telegraph the 10 a. m. indications, as they could be received before noon of each day, and would cover the greater portion of the ensuing twenty-four hours.

The benefits to be derived from the cold-wave and frost warnings can not be estimated, since they are invaluable to this section of the country. It is sufficient to state that one warning, received forty-eight hours in advance, would represent thousands of dollars to every sugar planter, and to the cotton interests in this State. These warnings receive as good a dissemination as is possible with the poor telegraphic facilities. The Great Southern Telephone and Telegraph Company has been very liberal in distributing the warnings along their lines, free of cost, to the managers of the various offices where they are bulletined. Many planters connected with this office by telephone receive the warnings direct, and I have inaugurated a system of notification by mail to outlying points from the nearest display station.

The past winter was very mild, there having been no cold waves or frosts to injure vegetation until after the crops were secured, so that but little benefit resulted during the past year from the warnings to planters. From a local standpoint the benefits were great to railroads, fruit and commission houses, ice-men, etc.

No floods occurred in the State during the past year, and the system of disseminating flood warnings could not therefore be tested. Reliable parties have been secured along the country affected by overflows, who, should a warning be sent at any time, will give the matter proper dissemination throughout the surrounding country.

The great storm of August, 19–20, 1888, afforded a great opportunity to disseminate information that would have been of incalculable advantage to steam-boat and other interests had money been available to telegraph and telephone a warning throughout the eastern half of the State. It is estimated that the damage from this storm was fully $2,000,000. How much of this could have been saved by warnings telegraphed and telephoned is a question; sufficient, at least, to have repaid the cost of the warnings a thousand times.

The weekly weather-crop bulletins were issued regularly during the growing season, and this feature of the State work is highly appreciated. The weekly bulletins from the several cotton-growing States are bulletined in this office, and are published by the local press, so that on Tuesday of each week a complete record of the weather and crop conditions is before the cotton-men and the general public through the courtesy of the directors of the various State services in the South. These bulletins are considered very valuable by the commercial and agricultural associations of this State, and it is hoped that the coming year will see Georgia represented so that we will have a complete cotton service.

It is to be regretted that the limited office force has precluded an inspection of the several stations of observation during the past year. An annual inspection is necessary for all stations reporting, and the service would doubtless have shown a greater improvement had an inspection been made. The work of the local signal office has been greatly extended during the year through the State service, and the office force should be increased by the detail of another assistant during the summer months, when an inspection of all stations could be made, and by the employment of a messenger.

MICHIGAN.

[N. B. Conger, observer, Signal Corps, director.]

The number of voluntary observers has been gradually increased during the year, so that there are now one hundred and twelve on the list, with an average of ninety-two reports each month. The faithful work which these observers have performed during the past year deserves the higest commendation. There are now one hundred towns in the State where the weather, temperature, and cold-wave signals are displayed, of which number only an average of forty make regular reports to the central office. One reason why there has been a falling off in the number of display stations is the general character of the indications, which are made for too large a territory to serve the localities where signals are displayed, as the peculiarities of the weather conditions of this State are such that a general prediction for "lower Michigan" will not cover the different localities; so that, where the indications have failed in particular places, although correct for the State at large, considerable dissatisfaction has resulted, and the signal display has been discontinued at some points on this account.

Another and principal reason for this dissatisfaction is the rain flag, there being no distinction between a local rain and a general rain. The people of this State thoroughly understand the difference between a general and local rain, as there was a flag to designate the difference in the old code. To illustrate the situation, the director would refer to the report, for the month of May, 1889, of the display of signals, as furnished by the reports of displaymen, in which the percentage of correct predictions was given as 72, while taking the reports of the voluntary observers for the State on rain-fall alone, the percentage of correct prediction was 86.3—a difference of 14.3 per cent. between the general predictions and those verified by the displaymen at their stations.

On June 24 the Chief Signal Officer issued authority to the director to use a local rain flag in this State, and it is believed that this will in a great measure obviate the difficulties with which this service has had to contend, as much satisfaction has been expressed by those interested in the work of the service upon the adoption of this flag, which, as suggested by the Chief Signal Officer, will be blue and white, half each, with white at the top.

RAILWAY WEATHER SIGNALS.

These signals are now displayed on the baggage cars of the following roads: Detroit, Grand Haven and Milwaukee Railway; Chicago and Grand Trunk Railway; Detroit and Canada Grand Trunk Junction Railway; Michigan Central Railway (main line and branches); Chicago and West Michigan Railway; Grand Rapids and Indiana Railway; Port Huron and Northwestern Railway; and the Pontiac, Oxford and Port Austin Railway. The director takes this opportunity to express his thanks to the managers of these lines for their courtesy in aiding the service to place the information of the weather changes before the people.

This method, as has been stated in previous reports, is the best that has as yet been adopted to reach the farming community at early hours for their benefit in their daily avocations. The system will be extended to cover three more roads in the course of the next three months.

The Weather Crop Bulletin, which has been regularly issued each Saturday morning during the growing season for the past two seasons, was resumed on March 30, and has been issued at 11 a. m. each Saturday since. These bulletins are sent to the voluntary observers, to the newspapers and their correspondents for telegraphing, so as to reach the afternoon daily payers and the secretaries of 230 granges, to be posted in the grange hall for the benefit of the members—in all, there are 470 bulletins issued each week.

A new feature added to the bulletin this season was the rain-fall chart of the lower peninsula, which exhibits the normal rain-fall for the past seven years. This chart has been of great service in determining the average weekly rain-fall over the sections where the most of the cereals of the State are grown, and the chart has been used to a great extent by the agriculturists during the season to ascertain the condition of the crops in the different sections. The director believes that this bulletin has been of great service to the agriculturists, especially this season, when the rain-fall was so badly distributed. The chart shows graphically the average fall of rain for the different sections, and proves the fact long maintained that the rain-fall in this State is very unequally distributed. The only improvement that could now be suggested would be the issue of a temperature chart to accompany the rain-fall chart, thus bringing the data bearing upon these two very important elements of crop-raising graphically before the farmer for his use.

During the last half of the year 1888 the monthly rain-fall charts for the State were completed, and in January they were published with the report of the director to the State Board of Agriculture. These normal charts have been extensively used since then, and one is used each month for comparison with the total rain-fall for the current month, showing the localities where the rain-fall has deviated from the average of the past thirteen years.

The director is now compiling the data for similar charts of the average temperature of the State, and more particularly to ascertain, if possible, the extent of the temperature belt which extends along the west shore of the State, which is popularly termed the "peach belt of Michigan." These charts are now begun, and the charts of the average temperature for the months of January, February, March, and April are now completed, and the remainder will be finished by the 10th of January, 1890.

These two sets will enable one to make an exhaustive study of the climate of this State and to arrive at some definite conclusions of the peculiarities of this climate, which is one of the important factors in establishing the service, and one which it is anticipated can be answered in a measure by the close of the next fiscal year.

The legislature made an appropriation of $8,350 for the expense of the service for the years 1889 and 1890 (copy of the act is inclosed) and this appropriation has enabled the director to place the service in first-class shape during the year, and will also allow of a small amount for the expenses of all the voluntary observers' stations, except the rain-fall stations, and they are provided for in having the American Meteorological Journal supplied to them free during the year. The maximum amount that can be allowed each station will be $12 each year, and this will go to such stations as have a barometer or a full set of instruments and take all the observations and correct them ready for use before sending them to the central office.

* * * * * * *

It is believed that this will have a great deal to do with the improvement of the service during the next two years, as the observers are justly entitled to compensation for their work, and this is in line of the policy of this service, which has been outlined in previous reports.

The appropriation has also enabled the director to furnish a uniform instrument-shelter to the observers, so that now the observers are all supplied with good shelters, or will be in the course of the next ten days.

In closing his report, the director desires to express his thanks to the State Board of Agriculture, under whose control this service is operated, for the many evidences of their interest in the work and for the very material aid in forwarding the service to a permanent place before the people of Michigan.

The transfer of the Hon. Edwin Willets from the presidency of the Agricultural College of Michigan to be assistant secretary of agriculture took away one valuable friend of the service, who was mainly instrumental in having it placed where it now is and having it take the stand which it now bears.

MINNESOTA.

[John Healy, observer, Signal Corps, in charge.]

The State weather service of Minnesota, as it is operated at present, is a system of co-operation of individual voluntary observers with the United States Signal Service, and has no connection with any local institution or society. The State of Minnesota has never extended any aid to this service.

At the last session of the legislature a number of public-spirited citizens of St. Paul (principally the members of the meteorological committee of the Saint Paul Chamber of Commerce) used extra endeavors with the members of the legislature to have the State recognize and adopt the service, but without avail. A bill to establish the service, introduced in the State senate last spring, was defeated by a vote of 12 to 10. This was the second unsuccessful attempt of the kind in the State legislature.

The service has been conducted until recently under the auspices of the Saint Paul Chamber of Commerce, and during the time that body co-operated with the service they furnished a room for the central office and paid certain expenses, such as messenger service, printing, etc. For its liberal support to, and efforts in behalf of, this service the Chamber of Commerce deserves the acknowledgment and thanks of the community at large.

Prof. William W. Payne, of Carleton College, of Northfield, Minn., who has devoted much valuable time and labor for the good of the State service, resigned his position as director on April 12, 1889.

Since the withdrawal of the aid of the Chamber of Commerce and the resignation of Professor Payne the work of the service has been continued without material change. The only change of note is that the monthly meteorological summary is written, and a sufficient number for distribution is copied by use of the cyclostyle, instead of issuing the printed bulletin as formerly.

The number of stations in operation on June 30 is as follows: Meteorological, including five signal-service stations, 20; weather and temperature display stations, 27; stations furnishing weather and crop reports, 17. The State service also furnishes the forecasts and warnings of the signal service to twenty-one cities and towns in Dakota.

Since the beginning of the present crop season, crop and weather reports have been received from an average of twenty-seven correspondents weekly, representing all parts of the farming area of the State. These reports are used in preparing a State service crop-bulletin, copies of which are distributed to the press for publication, and to the coöperating correspondents.

As the prosperity of the people of this State depends mainly upon the crops, reliable intelligence in regard to the same is eagerly sought. Therefore the crop-weather report is an important feature and is fully appreciated.

All monthly meteorological reports received at the central office have been prepared for publication and distribution. Copies of the same have also been regularly forwarded to the Chief Signal Office for the Monthly Weather Review.

The work of the State Weather Service is to take and record meteorological observations, display weather and temperature signals, and report on the condition of the weather and the crops during the crop season. All this information is given full publicity, and it is acknowledged to be of practical benefit.

There are eighty counties in Minnesota, and only twenty-one of that number are represented in the State Service Meteorological Report. It would be a great improvement to this service if reports on temperature and precipitation (if nothing more) could be had regularly from competent observers in each and every county in the State.

MISSISSIPPI.

[R. B. Fulton, observer, Signal Corps, director.]

Steady progress has been made in all the work of the service, particularly in the direction of increasing the number of observers, and the interest of the public in the benefits that may be derived from it. The number of observers in June, 1889, is 48, the number in June of last year being 36. The number of stations receiving the daily indications of the United States Signal Service is 10, and those receiving cold-wave warnings is 23.

The correspondence of the central office and the number of copies of the weekly and monthly bulletins sent out have been double what they were the preceding year.

The weekly weather-crop bulletins are extensively copied in the daily and weekly newspapers, and are regarded as a valuable indication of the progress of the staple crops in the State.

In early spring the cold-wave warnings of the Signal Service have been a most important factor in the growing of early fruits and vegetables. Many thousands of acres are devoted to this interest, and several hundreds of thousands of dollars are invested in it. Other agricultural interests are learning to depend on the indications of the Signal Service.

It is much to be regretted that the cotton-region observers of the Signal Service do not continue their observations throughout the year. This service has been able to induce only a few to act as voluntary observers during the winter months. Complete records for the year from these experienced observers would be very valuable.

The daily indications and cold-wave warnings telegraphed to points in Mississippi through the courtesy of the Chief Signal Officer have been distributed through the signal office at Memphis, Tenn. The postal facilities in this State are such as to make it impracticable to distribute this information through them in the forenoon from any center. Communities are thus obliged to rely upon telegraphic information.

On the whole, the last has been the most successful year of the service. Earnest efforts will be made to secure from the legislature, which meets next winter, substantial support for the State weather service.

MISSOURI.

[Prof. Francis E. Nipher, director; W. H. Hammon, observer, Signal Corps, assistant.]

During the past year the Missouri weather service has been conducted upon the same plan as heretofore.

The number of observing stations is now 48, the most of which make regular reports. A list of these stations with the names of observers is subjoined. This office has had nothing to do with the distribution of storm and cold-wave warnings, this work being in charge of the local signal station.

The work of the Missouri weather service has been: (1) To collect monthly weather reports from observers, computing all means and sums in the reports of volunteer observers. A digest of these reports is forwarded to the office of the Chief Signal Officer in time for incorporation in the monthly report of that office. A printed report is also issued to all observers and to such other persons as request it. (2) Weekly crop reports are also furnished to the newspapers, giving the general meteorological conditions prevailing and the effect upon crops. (3) Aside from this routine work an investigation has been undertaken upon the relative amount of rain-fall in cubic feet per second, and the river discharge in the same units, in various drainage areas in the Mississippi Valley. This work will cover an interval of ten years. It has been interrupted by reason of the arrest and trial of my assistant, Sergeant Weber, before a military court.

A second attempt has been made during last winter to secure the organization of the service as a State institution, with a view of gradually bringing about a system of local harvest rain-warnings.

With the legislative experience gained, I do not think it would be difficult to secure the passage of such an act, but I do not think it can be done without the use of methods which I decline to employ, and I have definitely and finally concluded to waste no more time in that direction.

I have had until recently the assistance of Sergt. G. A. Weber, of the Signal Service. He has rendered most efficient and satisfactory service, and his conduct has invariably been that of a perfect gentleman.

During the latter part of the year he has also had charge of the Signal Service station in Saint Louis. This is an exceedingly important station, and the responsibilities of the position are so large that it is impossible for me to secure very much of his time while he has charge of the Saint Louis station.

NEBRASKA.

[Prof. Goodwin D. Swezey, director; G. A. Loveland, observer, Signal Corps, assistant.]

The work of the Nebraska weather service has been carried on during the past year with an enlarging number of stations and a more general distribution of standard, and especially self-registering, instruments. Previous to this year very few of the observers were supplied with any instruments, except rain-gauges and exposed thermometers. A very few only had been supplied by the Smithsonian Institution or the Signal Service with other instruments, and fewer still had bought themselves such instruments. Only the Government signal stations, together with stations at Lincoln and the central station, had any complete outfit. During the past year there has been distributed by the Signal Service, through this office, standard rain-gauges and self-registering maximum and minimum thermometers to stations throughout the State at distances of 50 miles from each other. The reports from these stations have been received monthly, or weekly, at the central office and made the basis of a four-paged monthly weather and crop bulletin, including a map of precipitation. These bulletins have been sent to observers, to other weather services, and also to the press of the State for publication. The weekly bulletins have been used in the preparation of a weekly cyclostyle crop bulletin, and also a weekly telegram to the Chief Signal Officer, to aid in the preparation of the Crop Bulletin prepared each week by the Chief Signal Officer for distribution throughout the country. Twenty-four stations, selected and arranged by this service, have received the daily indications by telegraph from the Chief Signal Officer. There has also been sent out from this office daily, by certain mails, the special prediction, based upon the 8 a. m. observations, to a number of post-offices, where the forecasts were displayed for the benefit of the public.

During the year the service has remained in charge of the same director as heretofore, but in July, 1888, the present asssistant was ordered here, relieving Private C. D. Burnley. By the courtesy of Doane College the service has continued to use their Boswell Observatory for a central station.

NEVADA.

[Prof. Charles W. Friend, director; H. F. Alciatore, observer, Signal Corps, assistant]

The issue of the monthly weather review of this service was begun in February, 1888.

The State having appropriated a certain amount for the purchase of instruments, etc., a number of stations have been opened in addition to those already in operation. There are now thirty-four stations from which monthly reports of temperature, precipitation, wind, and weather are received; three of these stations are fully equipped, viz: the Government station at Winnemucca, the State University at Reno, and my own observatory at Carson City. I propose to increase the number of stations reporting barometric pressure to ten during the ensuing year. Richard's barograph will be supplied to a few selected observers in different parts of the State. The thirty-four stations of this service are well scattered throughout the State.

Owing to the deficiency in the appropriation made by the General Government for telegraphing daily forecasts, the number of display stations has, for that reason, been reduced to two, namely: Carson City and Reno.

The monthly reports received from our observers are full and comprehensive, as can be seen by the inclosed blank, Form No. 1, used by this service.

A number of observers, most of them farmers, furnish the central office monthly an additional report on the condition of crops, fruits, etc.

This service is indebted to the Chief Signal Officer for having detailed as my assistant a pains-taking and efficient member of the United States Signal Corps, in the person of Mr. H. F. Alciatore.

Beginning with March, 1889, a new and important feature of the Nevada Weather Review, issued monthly, has been the large and comprehensive temperature and precipitation charts, showing by shaded lines the distribution of temperature and precipitation throughout the State. The people of the State have now fairly realized, and fully appreciate, the benefits to be derived in the near future from a well-organized and well-equipped State service. Although this service has only been in existence for seventeen months, it has conclusively shown that the State can by no means be included in the rainless region of the great West, and that, if properly stored and carefully distributed, the annual rain and snow fall is sufficient to enable farmers to irrigate their lands, and mill-men to run their mills all the year round.

NEW ENGLAND METEOROLOGICAL SOCIETY.

[Prof. Winslow Upton, secretary; L. G. Schultz, observer, Signal Corps, assistant.]

The society, as in previous years, has performed the work of a weather service for the six New England States, and has attended to these duties in the manner explained in former reports. The observations and their publication have been made under the supervision of an officer of the society, who has been assisted by a member of the Signal Corps assigned to this duty. The conducting of the service during the past year has been under serious disadvantages, arising from the absence of the director of observations and from several changes in the assignment of an assistant, four members of the Signal Corps having in turn served the society during the year. On account of these difficulties, few efforts have been made to extend the work of the society, but the observations made have been collected and published without delay. The annual appendix for 1888, which contains a large amount of matter not published in the monthly bulletin, is now in press and will be issued in a few weeks.

Reports for each month have been received from observers numbering from 135 to 151. In nearly all cases the observers make continuous records during the year, and the changes occurring have been due to the discontinuance of certain stations and the establishment of others—changes inevitable in a system which is entirely voluntary.

In addition, a number of reports are received in the summer months only from agricultural experiment stations in Connecticut and from observers temporarily occupying summer residences. A meteorological observatory, well equipped with self-registering apparatus, has been established at Leicester Academy, in Massachusetts, by private munificence, and other additions have been made to the instrumental equipment of stations. The society receives no funds from the State authorities, and the purchase of instruments, as well as the current expenses of their use, is borne by the observers themselves.

The bulletin of the service is published in co-operation with the observatory of Harvard College. Its permanent matter is stereotyped, and will later appear in a volume of "Annals of the Observatory," thus insuring greater permanency and wider distribution of the results of the observations.

This arrangement limits the bulletin to a certain size of page and type, but the typographical appearance of the publication has been improved, and, while less matter appears each month than formerly this is more than made up by a large annual appendix. The bulletin is published about the middle of the month.

Beginning with January, 1889, an advance sheet has been prepared on the 4th of the month, containing a popular statement of the weather conditions of the previous month, which has been sent to all observers, and also widely distributed among the newspapers of New England.

No new investigation has been begun during the year, but the study of the distribution of precipitation in cyclonic storms, aided by a grant from the trustees of the Elizabeth Thompson Science Fund, and the discussions of observations of the *Sea Breeze* made in 1877, have been continued.

The supervision of the current work has been in charge of the secretary during the absence of Prof. W. M. Davis, the director.

* * * * * * *

Sergt. L. G. Schultz, Signal Corps, assigned as assistant to the New England Meteorological Society, makes the following statement relative to the weather-crop bulletin issued under the direction of the society: This work has been carried on in a manner as nearly as possible in compliance with the wishes of the Chief Signal Officer. Owing to the fact that many parts of New England can not be cultivated, the location for stations of observation for the present growing season were selected in view of the arability of the regions, and without regard for division by counties. Reports are received from fifty-one observers with tolerable regularity. A list of stations and observers, together with a base map showing their location, is inclosed. There are one hundred and seventy-five names on the mailing-list of the crop bulletin, including those of the more important New England and New York city papers, and twenty State exchanges.

The papers outside of Boston publish the bulletin almost bodily; the Boston papers use it in connection with the weekly bulletin from the office of the Chief Signal Officer, and devote about a column each week to the matter in their general New England and special State editions.

NEW JERSEY.

[Prof. G. H. Cook, director; E. W. McGann, observer, Signal Corps, assistant.]

At the close of last year the number of stations regularly communicating with this office was thirty-four. Four stations were discontinued and ten stations established during the current year, which makes a total of forty stations from which regular reports have been received. The monthly reports received from these stations have been forwarded to this office promptly, and a degree of accuracy attained in their preparation highly creditable to the observers, all of whom evince the keenest interest in the welfare of the service. During the past year a marked improvement has been made in the establishment of display stations owing to the increased interest manifested in the forecasts supplied.

The first weather-crop bulletin for the season of 1889 was issued from the central office on Saturday, April 13. The appreciation in which these bulletins are held has steadily grown, and at present the circulation of the weekly bulletin reaches 300,000 copies weekly, by its publication in all the leading papers of the State. The following statement indicates the appreciation of this bulletin by the farmers of the State:

"WEATHER AND CROPS—THE BULLETINS THAT BENEFIT THE FARMERS.

"It is highly probable that very few of the farmers who draw valuable information and direct profit from the weekly weather-crop bulletin, sent out from the central office under the charge of E. W. McGann, Observer Signal Corps, have any correct idea as to the trouble which such work entails. A good many doubtless have the idea that these bulletins are an official production of the officers of the Experiment Station and that they are furnished at the expense of the State.

"The fact is that these reports do not cost the State one cent, and they are not a part of the official duty of any officer connected therewith. They are prepared and sent forth by Mr. McGann himself, and they are the condensation of the reports sent to him by the observers who give their services gratuitously to the State. To prepare these reports and present them in the condensed, practical, and concise form in which they are now found so useful, is a work of no small mental and physical magnitude.

"It was in order to facilitate the work of collecting the necessary data that an appropriation of $1,000 was sought from the legislature last winter. This money was not wanted to pay for services of any kind, but to place instruments in the hands of observers. Observers now have to buy their own instruments, costing from $15 to $30 per set, or they have to do the best they can without them. The service has now about forty volunteer observers at as many different stations, and from their reports his bulletin is made up. If the State furnish the observers' instruments, which would be the property of the State, and transferable to others when the observers ceased their work from any cause, the area, quality, and quantity of information would be very largely increased, and the weekly bulletins greatly enhanced in interest and value.

"As the case at present stands, the United States Government is doing a gratuitous work for the benefit of farmers and others that is rapidly winning appreciation, and which should enlist the sympathy and encouragement of every one who recognizes that information in any direction means profit.

"As an instance of the recognition which Mr. McGann's effort is meeting, we give the following, which speaks for itself:

"'*Resolved*, That the Locktown Grange, No. 88, P. of H. of New Jersey, hereby express our high appreciation of the Weekly Weather Crop Bulletin issued from the Central Station of the New Jersey Weather Service at New Brunswick, and unanimously request that the same may be continued.

"'GEO. W. HOCKENBURY, *Master*.
"'V. C. BODINE, *Secretary*.'

"THE LATEST BULLETIN.

"Weather Crop Bulletin of the New Jersey Weather Service in co-operation with the United States Signal Service, New Jersey State Agricultural College, Central Office, New Brunswick, N. J., for the week ending Saturday, July 6, 1889:

"The average weekly rain-fall for the State for July, determined from observations covering a number of years, is about 0.94 inch. The rain-fall during the past week has been superabundant, and, as during the previous week, was unevenly distributed. The largest measurements reported for the week are as follows: In inches, South Orange, Essex County, 3.60; Tenafly, Bergen County, 3.46; Union, Union County, 3.06; New Brunswick, Middlesex County, 3.04; Locktown, Hunterdon County, 2.90; Trenton, Mercer County, 2.86; Moorestown, Burlington County, and Egg Harbor City, Atlantic County, 2.62; Bridgetown, Cumberland County, 2.87; Rancocas, Burlington County, 2.40; Valley, Hunterdon County, 2.40; Woodbury, Gloucester County, 1.98, and Walnford, Monmouth County, 'very little rain during the week.' Nearly all stations report the temperature about the average, with excessive cloudiness.

"The above conditions have made the week a most disastrous one to the farming interests of the State. The staple crops, especially wheat, both in shock and growing, have been seriously injured, that uncut being badly prostrated, and together with that in shock badly sprouting.

"Oats are reported rusting, heads turning dark and very much down. Very serious injury has also been done to the hay crop, great quantities already cut remaining on the ground during the entire week.

"Corn is generally prostrated, but will recover with warm sunshine.

"Small fruits have also been injuriously affected; grapes, white varieties, all rotting, and raspberries greatly damaged.

"Vegetables on sandy and high grounds have made a good growth during the week."

The bill entitled "An act to establish a meteorological bureau for the State of New Jersey" was, upon the convening of the legislature, laid before both houses, this time with the approval and cordial co-operation of the governor. In the senate it was generously received and passed without a dissenting vote. In the general assembly it was greatly delayed, and when the time came for it to be called up there was no quorum present. Thus for the second time this bill met defeat. It was favorably indorsed by a number of the most prominent men in New Jersey, who accompanied their indorsements with the most flattering letters of approvel to their representatives, requesting their hearty support of the measure. In these letters special attention was called to the value of the service, and the earnest desire was expressed that nothing would occur to prevent its unanimous passage. The action of the assembly was a very serious disappointment to the different observers, but has not affected their zeal in the least, they having expressed their determination to continue in the work and to make still another effort to secure the passage of the bill at the next session. Most encouraging assurances that this will be accomplished have been received.

NEW YORK.

[Prof. E. A. Fuertes, director; Isaac W. Brewer, observer, Signal Corps, assistant.]

In accordance with the provisions of chapter 148 of the laws of New York the commissioners mentioned therein met on June 19, 1889, and organized the State Weather Service. Prior to the passage of the above-mentioned act a provisional organization had been formed, and reports from such stations as had been supplied with instruments from your office or by private purchase were collected at this office; and beginning with September, 1888, a monthly summary of the above reports has been issued. There are at present fifty-three stations reporting to this service, six of which belong to the United States Signal Service.

The issue of the weekly weather-crop bulletin began March 23, 1889, with reports from twenty-eight correspondents. Since then the number of correspondents has been increased, until at present there are about sixty-five. The crop bulletin has been well received and is published in full by a number of the leading papers of the State.

The daily indications are telegraphed to forty-two points in this State, but flags are displayed at a greater number of places, as the reports are, in many cases, repeated by telephone to neighboring towns. Flags are closely watched, and it is a source of regret that, owing to the defective telegraphic communication between many of the stations and the points from which the reports are sent, the indications do not reach the public until twelve hours after issue. It is hoped that you may be able to find some remedy for this evil.

The predictions for the past eight months have been verified as follows: Weather, 82 per cent. have been fulfilled; for temperature, 83 per cent.; for weather and temperature combined, 82.4 per cent.

Steps are being taken to purchase instruments for the complete equipment of stations located equidistantly about the perimeter of the State; and at such other well-conditioned points of its interior as will enable this service to study in the most satisfactory manner the meteorological basins of the State. The commissioners of the New York Meteorological Bureau desire the co-operation, in this important question, of the experience and kind offices of the United States Signal Service.

In closing this report, at a time in which many other cares prevent more completeness, I desire, personally, as well as officially, to thank your office for the unmistakable, genuine interest always displayed by the Chief Signal Officer in connection with the weather service of this State. Also, acknowledgment is due to Capt. H. H. C. Dunwoody, to whom the weather service of New York State is much indebted on account of the diligence, efficiency, and administrative tact this distinguished student and officer has always shown in developing the welfare of the meteorological interests of New York. I have also to report that Assistant Brewer, detailed by you to this office, has proved himself efficient, exceedingly industrious, and his services, which have been onerous and continuous since his arrival at this bureau, deserve substantial recognition, and, if allowed to suggest a well-merited recompense, promotion in his rank in the Army.

"CHAP. 148.—AN ACT to establish a State meteorological bureau and weather service, and to make an appropriation therefor. (Approved by the governor April 15, 1889. Passed, three-fifths being present.)

"*The people of the State of New York, represented in senate and assembly, do enact as follows:* SECTION 1. There is hereby established a State meteorological bureau and weather service, which shall be under the control and management of three commissioners thereof. The State superintendent of public instruction, the professor of civil engineering of Cornell University, and a competent person to be appointed by the governor, by and with the advice and consent of the senate, whose term of office shall be three years, shall be such commissioners, who shall receive no compensation for their services as such commissioners. The said commissioners may appoint a competent person, who may be one of their own number, to be director of said bureau and weather service, who shall receive no compensation for his services as such director.

"SEC. 2. The central station and office of said bureau and weather service for meteorological observation and experiment shall be at Cornell University. The said commissioners shall establish, if practicable, one or more volunteer weather stations in each Congressional district in the State, and supervise the same, co-operating with the Chief Signal Officer of the United States for the suitable locations of stations, in order to increase the usefulness of the State and national services. The said commissioners are authorized to print monthly reports of the results and operations of said bureau and weather service, and to distribute the same in such manner as they shall deem most serviceable to the people of the State.

"SEC. 3. The sum of four thousand five hundred dollars or so much thereof as may be necessary, is hereby appropriated out of any funds in the treasury not otherwise appropriated, for the purposes of carrying out the provisions of this act, to be paid to said commissioners, or to their order, by the treasurer upon the warrant of the comptroller, upon the vouchers of the commissioners and said director: *Provided, however*, That no part of said sum shall be paid for salaries for any officer or officers, but a reasonable compensation may be paid for the services of a clerk at the central office, and for printing and other necessary and proper expenses of said commissioners.

"SEC. 4. The said commissioners shall annually report to the legislature their expenditures under the provisions of this act, and such other information as said commissioners may deem desirable or as the legislature may require.

"SEC. 5. This act shall take effect immediately."

NORTH CAROLINA.

[Dr. H. B. Battle, director; H. McP. Baldwin, observer, Signal Corps, assistant.]

The North Carolina weather service, which was established in 1886, continued in operation during the year ending June 30, 1889, and the reports received during the year indicate that this service has proved of value to the people of the State, both in affording facilities for the distribution of weather forecasts of the Signal Service and in the collection of meteorological and weather-crop reports, which have been greatly appreciated by those interested in agriculture. The weekly weather-crop bulletin has been regularly issued during the growing season and widely distributed throughout the State, it being republished in the daily and weekly papers. This bulletin contains, not only a summary of the reports received from the various counties, but also extracts from the reports made by the observers. During the month of May, 1889, reports were received from twenty-seven voluntary observers of this service, and twenty-six stations are supplied with the forecasts of this service by telegraph.

No statement has been received from the director relative to the work of this service during the current year.

OHIO METEOROLOGICAL BUREAU.

[Prof. Benjamin F. Thomas, director; C. M. Strong, observer, Signal Corps, assistant.]

There has been no change in the lines of work carried on by this bureau during the past year. We have confined ourselves to the securing of reliable and continuous observations and reports from the several stations, the preparation from these reports of the matter for our monthly and annual reports, and the distribution of them and of the weather reports and general matter furnished us by you. Advanced summaries of the monthly reports have also been furnished to the Associated Press and to your office. Our observers have also made weekly reports of weather-crop conditions, which have been reduced and telegraphed to you by Corporal C. M. Strong for use in the weekly weather-crop bulletin. Special reports have been furnished to you from time to time, and also to others in and out of the State. A list of the stations of the bureau, giving the names of the observers, equipment, times of observation and reports made by them is inclosed, as is also a list of display stations receiving the daily weather telegrams. The demand for this last-named service does not seem to be as great as in some other States. We have had frequent notices of the opportunity to obtain the service printed in the press of the State, and have issued several circulars from the office concerning the matter, but the number of applications received is small. The explanation, doubtless, is that the daily papers reach all parts of the State at an early hour, and many of those wishing the predictions get them in that way, and do not care to undertake the additional expense and care necessary for the flag display.

The work of the bureau is giving increased satisfaction to the public. Our reports are in demand, and in some cases, particularly of the annuals, the edition is exhausted. We have on file a number of applications for new stations, which we are obliged to deny at present, the means provided us not being sufficient to enable us to procure the instruments.

We are greatly indebted to you for substantial aid in the prosecution of our work. It would have been impossible for us to maintain its scope and character during the past year without the generous help you have given.

Corporal C. M. Strong, detailed to assist us, has earned our best indorsement by his earnest and faithful work in the office. We regret exceedingly that the interests of the Signal Service require his transfer to another post.

The bureau has been fortunate in having for its secretary Lieut. C. E. Kilbourne, United States Army. His familiarity with meteorological work through former connection with the Signal Service has made his services of peculiar value to us.

OREGON.

[Hon. H. E. Hayes, director; B. S. Pague, observer, Signal Corps, assistant.]

During the past fiscal year this bureau has developed from a semi-official one into a complete legal organization. The organization of this bureau was started at Roseburgh, Oregon, by the present assistant director in January, 1887, the first report being published in a newspaper on April 16, 1887. It met with support and co-operation from the start, its value and importance being realized. In May, 1888, the publication of a paper entitled "Oregon State Weather Review and Agricultural Report" was started for the better dissemination of the information collected by the service. At the commencement of the present fiscal year the central office was at Roseburgh, and under the control and management of the present assistant director, who continued in charge and who issued the monthly paper until August 15, when he was relieved by Sergt. William Bell, Signal Corps, who allowed the publication of the paper to drop and who issued the small monthly reports that were issued when the service was first organized. This continued until December 22, when the present assistant director was ordered from Philadelphia, Pa., to Portland, Oregon, to take charge of the observer's office at that point, and with special instructions to reorganize the Oregon State weather bureau. Steps were taken immediately to prepare a suitable bill and to present it to the Oregon legislature at their session in January and February, 1889. Though appearing before that honorable body almost a stranger, yet the possibilities of such an organization, resulting in benefit to the State, were so plainly seen by the members that the following bill was promptly enacted:

"AN ACT to establish a State weather service in the State of Oregon, for the purpose of co-operating with the United States Signal Service in the collection of climatic data, and publishing the same, to disseminate more speedily and thoroughly the United States Signal Service weather forecasts, storm and frost warnings, for the benefit of the citizens of this State; to establish in each county one or more meteorological stations, and making an appropriation therefor.

"Whereas by reason of the limited facilities of the United States Signal Service the practical benefits to be derived from the weather forecasts, storm and frost warnings of said service are greatly restricted, especially in the agricultural districts, by the want of proper means for disseminating these official reports promptly; and

"Whereas by the organization of a State weather service co-operating with the United States Signal Service the weather forecasts, storm and frost warnings may be more rapidly and widely disseminated throughout the State, whereby the value of the same to the agricultural and other interests will be largely increased; and

"Whereas the climatology in the State has never been observed and recorded in three-quarters of the State, as is necessary for the best promotion of the various industries; and

"Whereas, Oregon possesses within its borders all varieties of climate, and these varieties are but dimly understood by the citizens of our own State, and to the outside world they are almost unknown; and

"Whereas the States of Alabama, Illinois, Indiana, Iowa, Minnesota, Mississippi, Missouri, Nebraska, Massachusetts, Ohio, Pennsylvania, Michigan, Tennessee, and many others have already established and maintained by State aid State weather services by appropriations ranging from two to eight thousand dollars, and they have proved of great value to the State generally: Therefore,

"*Be it enacted by the legislative assembly of the State of Oregon:* SECTION 1. That there shall be, and hereby is, established in the State of Oregon a weather service, which shall consist of a director and an assistant director, and one or more meteorological observers in every county in the State.

"SEC. 2. That the governor be and is hereby authorized and directed to appoint a director of the State weather service, who shall hold office during the pleasure of the governor and who shall be duly qualified as like officers of the State.

"SEC. 3. The Chief Signal Officer of the United States Army shall appoint the assistant director.

"SEC. 4. That on the recommendation of the director and his assistant, the secretary of state be and is hereby authorized and directed to name and appoint one or more competent meteorological observers in each county of the State for the purpose of recording and transmitting meteorological observations to the central office.

"SEC. 5. That the secretary of state be and is hereby authorized and directed to purchase and to furnish to each of said observers such standard meteorological instruments as are used by the United States Signal Service, and such flags and other necessary equipments as shall be designated and approved by the director and his assistant.

"SEC. 6. That the central office of the Oregon State weather service shall be located in the city of Portland, Oregon, and to which the State weather observers shall send their reports.

"SEC. 7. That the director and his assistant shall receive all reports and reduce them to tabular or other forms, and shall disseminate the same by all available means, and make a monthly report to the State printer for publication as 'Oregon State Weather Service Report,' co-operating with the United States Signal Service, and to make an annual report to the governor, detailing the operations of the service during the year.

"SEC. 8. That the State printer be authorized and is hereby directed to print all reports, not less than 2,000 copies each, of the Oregon State weather service reports submitted by the director and his assistant.

"SEC. 9. That the service of said director, his assistant, and of the observers of the 'Oregon State weather service' shall be without compensation or expense to the State of Oregon.

"SEC. 10. That the sum of two thousand dollars ($2,000) be and the same is hereby appropriated out of any money in the treasury not otherwise appropriated for the purpose of carrying into effect the provisions of this act.

"SEC. 11. That there shall at no time be paid to any one any compensation whatever out of the money hereby appropriated, except such sum not to exceed twenty (20) dollars per month, as shall be decided upon by the director and his assistant for the pay of clerical hire.

"SEC. 12. This act shall take effect from and after its passage and approval by the governor.

"Approved February 25, 1889."

The governor appointed Hon. H. E. Hayes, master of the Farmer's Grange of Oregon, the director of this bureau, and the Chief Signal Officer appointed B. S. Pague, sergeant, signal corps, the assistant director. The first monthly report issued under the new organization was for the month of April, 1889, which consisted of a pamphlet 9 by 12 inches, and of twenty-five pages of printed matter. The report for the month of May is as large, but future reports will be smaller, unless unusual weather or crop conditions prevail.

The monthly reports have been most favorably commented upon by the press and the public. An interesting and valuable feature of this bureau is its weekly crop-weather reports. Nothing so far in the work performed has been of so much general interest as these reports. Wheat dealers, elevator-men, commission merchants, the board of trade, railroad companies, and implement dealers call at the office for reports daily, and on Saturday, when the report is issued, they call and wait for information from it. It is expected that next year the crop report will extend to the Palouse region of Washington Territory, the great wheat section. Business men of this city are as much interested in this section as they are in Oregon sections.

The instruments for this bureau have not as yet been received from the manufacturers, but it is hoped to have them distributed by August 1, next. While the principal investigations will be made relative to the range of temperature and the precipitation, yet other climatic conditions will be observed. Certain stations will be equipped with mercurial barometer, barograph, thermograph; dry bulb, wet bulb, maximum, and minimum thermometer; wind vanes, anemometer, Maring anemometer support to anemometer, sunshine recorders, evaporimeters, soil thermometers, terrestrial minimum thermometer, solar-radiation thermometer, ozonometer, rain-gauges, measuring sticks, battery cells and supplies, and weather-temperature flags, lactometers. Cream-gauges and self-registering rain-gauges have also been ordered. The central office will be thoroughly equipped, and it is hoped to receive sufficiently liberal future appropriation as to enable most of the stations to be equipped as the central office will be.

Time, attention, and hard work, will gradually develop this bureau into a most valuable organization. It is hoped to visit the mechanics' fair or industrial exposition held in Portland, Oregon, in October, and have an exhibit of instruments; also to visit the State Agricultural Society fair held at Salem in September, and in this way place more prominently before the masses of people this bureau, its object, aim, and utility. A series of lectures will also be arranged for, to be given to the high school of Portland, Oregon, and to the more prominent colleges of the State. In this way the future citizens will have a knowledge of the service and what benefit it is to the people.

The benefits expected to accrue from this organization are information of scientific value and of value to the soil-workers, merchant, lawyer, physician, board of trade, immigration societies, real-estate dealers, railroads, engineers, surveyors, and to the general public. An understanding of climatic condition is necessary to the farmer in order for him to properly and successfully prosecute his industry. To the merchant weather phenomena is of value, especially so, when used and presented in connection with crop reports, for from them the possible prosperity of his community may be obtained. To the implement dealer especially it is of value, for it will to a certain extent regulate his stock in trade. To the lawyer reliable statistics relative to the climate are frequently necessary for use in legal cases; property, and sometimes lives, hang on the weather conditions that prevail at a certain time. This bureau will be the means of having such a record. To the progressive physician climatic data are necessary for his practice. Climate and health go hand in hand; and it is as necessary to understand climatic conditions as it is to understand the effect of the various drugs on the human system. As soon as a more thorough study of the relation of climate to health is made, the physician will be more able to master disease and ill-health. To the board of trade, representing the financial conditions of a community, climatic data are necessary so that they will have an understanding of past and present, and form an idea of future weather conditions and then be enabled to conduct with a better understanding their business as it affects supply, demand, and shipment of products and wares. To the immigration organizations and real-estate dealers, such an organization as this is expected to be is the foundation of their success; it is as necessary to them as moisture is to the soil.

A settler or an immigrant first inquires as to the climatic conditions and the constituents of the soil; without this information he will seldom be induced to settle in a region. Hence for the settlement and development of a country this bureau is a necessity. Railroad companies, mining, construction, and surveying engineers rely on climatic data for their operations or prosecution of their work. It shows to them the source and supply of water, its duration of fall, and its effects. The movement of merchandise and passengers is affected by the weather, and to these information relative to the weather is a necessity. The benefits of weather bureaus and the climatic data collected by them could be written upon almost indefinitely, but other matter yet remains to be spoken of.

CROP WEATHER REPORTS.

This feature of the State service is one of the most valuable adjuncts, and, briefly to show its importance and the interest in it, it can be said that in Oregon there are 100 newspapers, daily, weekly, and monthly, and out of this 100 over 85 per cent. of them either publish the reports in full or give extracts from them. If they were not of value, or their readers were not interested in them, they would not be published.

For an estimate, to show how well these reports are distributed in Oregon, the following may be given: Ninety papers publish weekly the report; average for each paper, 800 subscribers, and it is a small estimate to say that every paper is read by 5 persons; so that on this hypothesis 360,000 persons read the weekly crop weather report issued from this office.

The monthly report, issued about the middle of the succeeding month for which it is the record, has also a wide distribution. The first monthly report has an edition of 5,000 copies; future editions will consist of 2,000 copies, unless special reasons are had for issuing a greater number. These reports are distributed by this bureau to the coöperating observers or correspondents, to the press, colleges, libraries, commercial organizations, railroads, and to the Oregon Board of Immigration, for their distribution through the country.

SUGGESTIONS.

For the better management of this bureau, and at the same time to better subserve public interest, the Assistant Director should be able to devote all of his time to this State bureau. As it now is he has the regular Signal Service Office at Portland, Oregon, under his charge, as well as the State bureau; the result is, too much and too many varied occupations to do full justice to them all. Previous to the organization of this bureau, he had the same regular office work to do as he has now, with one assistant; and now the arduous work of this bureau is also upon him with no additional assistance. It is hoped that some arrangement can be made by which his work will be lessened, and more time given for the State service work.

An additional Office room is very necessary. The present central office is in the observer's office in Portland, Oregon, and the result is that the one room is too much crowded to admit of comfort, systematic arrangement of forms, reports, etc., and for the good appearance of the premises.

The Chief Signal Officer could benefit this service if he endeavored to remedy the two matters mentioned above, and also by including in his national weekly crop weather report, reports from Oregon. A benefit would also arise from the extension of the system of telegraphic weather forecasts. Much valuable aid has already been rendered to this bureau by the very liberal policy pursued by the Chief Signal Officer toward it. In conclusion it may be said that by proper care and attention the Oregon weather bureau will soon stand among the model bureaus of the country. Such is the desire and aim of the director and his assistant.

PENNSYLVANIA.

[Under the direction of the meteorological committee of the Franklin Institute; T. F. Townsend, observer, Signal Corps, assistant in charge.]

The corps of observers for the past year averaged forty-seven. Eight hundred copies of the weather review, in addition to the issue of the journal of the Franklin Institute, were published regularly each month and distributed. Each review contained tabular reports from about forty-five stations. Most of the records have been continued since the organization of the service. Great praise and thanks are due to the observers for the labor and time they have contributed in bringing the service to its present standing. It is to be hoped that with the present appropriation a system of inspection can be made and the best localities selected for additional stations. It is the intention of the committee to have at least one reporting station in each county and to largely increase the rain-fall records.

An average of about thirty weekly crop reports were received last year, and a Weekly Crop Bulletin was issued each Saturday. From these reports the weather conditions and their effect upon growing crops were telegraphed each Saturday evening to the Chief Signal Officer, for use in preparing the Weekly Crop Bulletin issued from the Signal Office. Both the State and national crop bulletins were reproduced in many parts of the State. The display stations of the State averaged over sixty, and, owing to their value and popularity, they could have been largely increased had the appropriations for the Signal Service been sufficient to have warranted the additional expense of telegraphing the forecasts and cold-wave warnings.

Ever since the establishment of the State service persistent efforts have been made to collect the climatic data of the State that have for years been preserved only in manuscript. This effort has been largely successful, and, through the courtesy of the Chief Signal Officer and Professor Lorin Blodget, these data, together with that heretofore published in different works, have been collected and are now being published in the annual report of the secretary of internal affairs.

As this data covers long periods and often years of unbroken records, its preservation in this concise form will be both valuable and convenient for reference and comparison. These records include observations of the observers of the first State weather service, organized in 1837, for which the State made an appropriation for the purchase of instruments. While this previous step of Pennsylvania established the value of a permanent State system for recording climatological observations, now universally recognized in the separate services, it also demonstrated the necessity of a national system like the Weather Bureau of the Signal Service to serve the immediate public interests in the daily atmospheric changes. The value of each is now understood and appreciated. The State service is not only a valuable auxiliary to the Signal Service, but it provides for the permanent records of temperature, rain-fall, and other climatic conditions over smaller areas than can possibly be done by the Signal Service. The fixed and constant values or quantities of the climatic conditions of a place should be determined as carefully as its elevation or its geographical position. It is shown by the exigencies of each year that the most important of current interests, the life and the health of the people, and the safety of property and business depend largely on a proper knowledge of the mean and extreme conditions of the climate. This fact was most forcibly illustrated by the recent floods in this State which were so destructive to life and property. While the Signal Service had but one station in the flooded district, the State service had a number of stations, where the observers gave the exact rain-fall and other conditions. Each year adds greatly to the value of the recorded weather observations as well as to the facilities and resources of the public in the collection of data for determining all questions of a practical character.

Under the present State system there are now nearly two years of careful records from over forty stations supplied with standard instruments. From these records can now be furnished valuable data for engineering and for sanitary purposes to the towns and districts in which the stations are located. These stations of observation will be largely increased as rapidly as possible, for which purpose the State has made a liberal appropriation of $5,000 for the next two years.

SOUTH CAROLINA.

[Hon. A. P. Butler, director; H. C. Seymour, observer, Signal Corps, assistant.]

This service has at this time twenty-one display stations located on the lines of the Western Union wires. In view of the limited appropriations by Congress for telegraphic service, there may be a possible reduction in the number of stations, yet it is earnestly desired that, if compatible with the best interests of the public service, no decrease be made, but rather an increase, so that stations may yet be established at such points as may be of more extended utility to the community at large.

During the seeding, growing, and harvest season, crop weather reports have been received from an average of one correspondent in each county in the State. During the present crop season, which commenced March 9, these have been collected and published in the form of a weekly weather crop bulletin, and extensively circulated, as also published in the leading local and State papers. These reports have become of general interest, especially to parties concerned in handling the different farm products. Upon application for the same they have been supplied to parties outside the State, who are interested in the growth and prospect of the staple crops.

There has been no legislation by the State in aid of the weather service. What has been done thus far has been effected by the Department of Agriculture, which, since the establishment of the service, has appropriated and distributed the sum of $1,689.75, which has been expended in the purchase of instruments, indications flags, publications, etc.

A State river service has been inaugurated, but at present is in but a fair working condition, there being at present nine observation points, and seven observers, who are paid for their services from an appropriation made by the Board of Agriculture for that purpose. In a short time before the flood-danger season arrives it is expected to locate river observers at all principal river points in the State.

Appended is a statement showing the names of stations, names of observers, and the kind of meteorological instruments at, and the forms and reports rendered from, each station under the control and co-operating with the State or local weather service of South Carolina, June 30, 1889.

TENNESSEE.

Meteorological department of the State Board of Health, J. D. Plunkett, M. D., director; H. C. Bate, observer, Signal Corps, assistant.

The year has been rather a prosperous one for this service in Tennessee. While the number of voluntary stations has not materially increased, several new stations have been added, with generally a better class of observers, and the older observers have, as a rule, been prompt and faithful in their reports, and have shown an increased interest in their work. We have now, including the four regular stations of the United States Signal Service, about forty stations in the State, with promise of others in the near future. Most of these are in the hands of competent and willing men, who take an interest in meteorology, and who will, no doubt, maintain the standard hertofore attained by this service in the State.

The publication of the Weekly Weather Crop Bulletin, which was discontinued October 1, was resumed March 1. This is one of the most valuable bulletins emanating from the State or Signal Service. Interest in it is increasing each year, not only among merchants, shippers, carriers, and others more or less interested in the condition and yield of the various agricultural products of the State, but the farmers themselves are becoming more and more interested in the data which may be useful to them in studying the effect of the weather on crops.

The collection of meteorological data during the past twelve months has been attended with success so far as the limited facilities possessed by this department have rendered it practicable. We need, however, in some portions of the State additional observers, negotiations for which are now progressing, to cover territory which at this time is practically vacant.

As yet we have not succeeded in getting our legislature to make a specific appropriation for the proper maintenance and development of this department, but we are gratified to say progress has unquestionably been made in that direction, and especially so, we believe, with the general assembly, whose sessions have but recently closed. Tennessee has never made an appropriation for meteorological purposes, but appreciating the direct connection existing between meteorology and human health and disease, the State Board of Health have undertaken to the fullest extent of their limited means to sustain and develop this very important, but little understood and appreciated, field of scientific research.

The monthly reports of this department have been published each month in the State Board of Health Bulletin, and have been widely circulated throughout Tennessee, the United States, and Canada; besides many have been sent abroad.

This service has grown rapidly in public favor, especially here at home, and, as the people are acquainting themselves more with the workings of the service and with the science of meteorology generally, and its very intimate relations to personal and public health, the agricultural interests, and various other industrial pursuits, they are beginning to recognize its real value, and to give it at least moral support. This will doubtless lead to something better in the course of time.

TEXAS.

[Dr. S. O. Young, director; I. M. Cline, observer, Signal Corps, assistant.]

The original intention was to make the service a local and private affair, and when the first steps toward organizing were taken, only the services of the correspondents of the Galveston News and Dallas News, to the number of 450 or 500, were intended to be used. It was to have been a private affair, pure and simple, conducted entirely by the News. However, on the suggestion of Sergeant Buell, local Signal Service observer at

Galveston, this plan was abandoned, and the service was organized on a broader and more comprehensive basis. The Galveston Cotton Exchange assumed the responsibility for all necessary expenses, publication of monthly reports, etc., and the hearty co-operation of the United States Signal Service having been secured, the success of the State service was at once assured. The co-operation of the United States Signal Service gave us at once a nucleus around which to build, for aside from the regular Signal Service stations in Texas, there were twenty-five organized stations, making what is known as cotton-belt reports.

The chief work of the year has been directed towards perfecting old stations and establishing new ones. In addition to the twenty-five old stations, thirty new ones have been established, and all have been supplied with instruments. Weekly reports are recived from twenty-five stations and monthly reports from fifty-five stations. During the critical period of the year, Weekly Crop Bulletins have been issued, and for each month since January 4, 1889, a monthly report, containing data relating to temperature, rainfall, force and direction of wind, and other meteorological information has been issued, copies of which, together with copies of the weekly bulletin, are inclosed for your information.

These publications have met with a very favorable reception, and have done much to make the service a valuable one. This is particularly true of the weekly bulletins, each one of them being published by all the leading papers in Texas and New Orleans the morning after it is issued here, the expense of telegraphing being borne by the papers themselves. There are at present thirty-one points receiving weather forecasts by telegraph. All these stations are furnished with flags and cold-wave signals, furnished at the expense of those receiving the warnings. This branch of the service has been favorably received and has done much to popularize the whole service.

During the year there has been an important change in the working force. This was the removal of Mr. Allen Buell, who rendered valuable assistance in the establishment of the service, and who organized and perfected many of its important details. He has been succeeded by Dr. I. M. Cline, a young man of talent and ambition, whose interest and pride in the work before him are sure guaranties of his future usefulness.

The Texas weather service is young as yet, this being the first year of its existence, but it has already attained a position scarcely second to the service in any of the other States. Texas offers a wide field for such work, and everything now points to a very bright future. Plans are now being perfected which, if successful, will greatly increase the scope and efficacy of the State service. It is the intention to establish within the State a system of telegraphic reports, similar in many respects to the reports gathered by the regular Signal Service of the Government. If the Texas railways will co-operate with us, and there is every reason to think that they will do so, daily reports will be received from about fifty stations in the agricultural districts of the State, which will be properly arranged and a map issued each morning, giving the exact conditions of the cotton and grain growing districts at a fixed hour on that day. Such a map would be of the greatest value to the members of the Galveston Cotton Exchange, to whose enterprise and liberality the State service is so greatly indebted.

In conclusion, I have the honor to inform you that owing to increased duties and responsibilities placed upon me recently I find it impossible to continue my connection with the State weather service, and shall therefore place the control of it in other and, I trust, abler hands. I have accomplished all that I set out to do, organized and in some degree perfected the service, and others can now take hold and carry on the work much better than I, under the circumstances, can hope to do. Within a few days I shall notify you who the Cotton Exchange chooses to succeed me as director.

Before closing allow me to thank you and the gentlemen of your office for the great kindness you have always shown me, and the invaluable assistance you have given me in the work I have had in hand. I shall ever hold in grateful remembrance your many acts of courtesy and thoughtful kindness.

It will be seen from an examination of the reports relative to the local State weather services during the current year that the information collected by these services has been of value to the many and varied interests of the country. They have proved especially valuable to the agricultural interests by furnishing not only information relative to the condition of the staple crops from week to week during the growing season, but the meteorological data from which the climatic conditions of every section of the several States have already been more or less accurately determined. Special emphasis has been given to the value of the crop bulletins, both national and State, and they are recognized throughout the agricultural sections of the country by all engaged in the production or sale of the staple crops as one of the most useful features of the public service. The farmer, the dealer, and the speculator are placed upon the same plane so far as the information bearing upon the condition or future prospect of the crops is concerned. The exact condition of the crops in the various sections of the country, which, previous to the issue of these bulletins, was collected by dealers at great expense, is now widely published each week during the season and placed in the hands of the farmer without expense, from which he is enabled to determine the probable value of his crop and the most favorable time and place for its sale.

A number of the State services, especially those of Louisiana, Alabama, Nevada, Oregon, and Dakota, have utilized the reports furnished by the observers in determining features of climate, which it was previously thought did not exist within the limits of the States, and this information has been published in the form of circulars, which have been widely distributed throughout this country and Europe, with a view of inducing a wholesome immigration to those States.

The services of Colorado, Kansas, and Nevada are supplying valuable rain-fall data, which is already being used in the study of the irrigation problem, which is at present attracting wide attention.

The services of Tennessee, Michigan, and Pennsylvania have furnished data which have been used in determining the relationship of atmospheric conditions to health. The systematic and continuous observations over large areas of territory have enabled physicians to study weather changes in connection with the occurrence and treatment of special diseases and the preservation of the public health. The services of New England, North Carolina, Alabama, Pennsylvania, and Michigan have utilized the meteorological data collected in the study of the science of meteorology, and the results obtained have a direct bearing upon the work of the national weather service, and such studies, if continued, must necessarily result in an improvement in the national service. The State of Pennsylvania supplied rain-fall reports which enable the Signal Service to publish promptly in the current Review, a detailed account of the recent destructive floods in that State—a report which could not have been prepared had the Pennsylvania State service remained unorganized.

The local services, although separate and distinct in organization, can only give the best results to the people of the State by a full co-operation with the national weather service, while the national service is largely benefited by a full co-operation with the local services, which offer facilities for the distribution of weather forecasts, frosts, and cold-wave warnings for the benefit of the public. Not only do the local services afford means for prompt distribution of the valuable information to the public, but they enable the Signal Service to collect at the State centers the weather and crop reports which form the basis of weekly telegrams, showing the effect of the weather upon crops, and which are utilized in preparing the Signal Service weather-crop bulletin.

The meteorological reports collected in the central office from local services have been used in the preparation of the Monthly Weather Review; and the charts accompanying that publication, exhibiting the distribution of rain-fall and temperature for the month, have been improved and are now much more accurate, being based upon upwards of two thousand reports, while previous to the establishment of State services about one-fourth of this number of reports was available for the construction of these charts.

The improvement in the work of these services during the past year is largely due to the liberal support given to them by the Chief Signal Officer, and his foresight in securing the necessary legislation authorizing the purchase and distribution of meteorological instruments to voluntary observers.

While few of the services have been organized by State legislation and receive appropriations from the State for their support, the Chief Signal Officer has continued the detail of a Signal Service assistant for each service, and supplied blanks, franked envelopes, and forms for all, and a number of the services have been almost wholly maintained by the Signal Service.

It is to be regretted that the States of Illinois and Minnesota have not placed the excellent services in those States upon a substantial basis. In Illinois, through the energy and efficient management of Col. Charles F. Mills, secretary of the State board of agriculture, a local service of long standing was maintained, from which the farming interests of the State received substantial benefits. The withdrawal, owing to lack of funds, of the support of the State board of agriculture from the Illinois State weather service during the past winter left this service completely under the control and management of the Signal Service, and I am pleased to be able to report that Sergt. John Craig, Signal Corps, has ably managed the work of the Illinois State service, and continued it with excellent results.

The failure of the Minnesota legislature to organize the State weather service in that State was followed by the withdrawal of the support previously given by the St. Paul Chamber of Commerce and the resignation of Prof. William W. Payne as director of the service. The loss of the services of Professor Payne in this important work, which he had the public spirit to organize years since, and to which he has given so much of his valuable time, is greatly to be regretted, as he fully appreciates the value of the State service to the people of the State, and has the ability to extend its usefulness to almost every branch of industry. The Minnesota State service has been continued wholly by the Signal Service, under the management of Private John Healy, who is to be commended for the successful operation of this feature of Signal Service work.

The total number of stations furnishing reports to State and local weather services is 1,470, distributed as follows:

States.	No. of stations.	States.	No. of stations.
Alabama	34	Nevada	34
Arkansas	71	New England	165
Colorado	58	New Jersey	40
Illinois	51	New York	42
Indiana	34	North Carolina	27
Kansas	94	Ohio	90
Kentucky	32	Oregon	29
Louisiana	58	Pennsylvania	47
Michigan	169	South Carolina	29
Minnesota	48	Tennessee	40
Mississippi	48	Dakota	28
Missouri	34	Texas	69
Nebraska	42	Iowa	57

In closing this report I desire to invite the attention of the Chief Signal Officer to the excellent service rendered by the Signal Service assistants detailed for duty with the State services, and to recommend that the pay of such assistants be increased to the highest limit, and that all assistants below the rank of sergeant be promoted to that grade, as the nature of the services is such as to entail upon them unusual expenses which are not incurred while serving in other branches of the service.

Very respectfully, your obedient servant,

H. H. C. DUNWOODY,
Captain, Fourth Artillery, Signal Officer, and Assistant
in charge of State Weather Services.

The CHIEF SIGNAL OFFICER.

APPENDIX 5.

REPORT OF THE OFFICER IN CHARGE OF RECORDS DIVISION.

SIGNAL OFFICE, WAR DEPARTMENT,
July 1, 1889.

SIR: I have the honor to submit the following report of the work of the records division for the fiscal year ending June 30, 1889. This division has now been in existence two years and four months, having been established for the purpose of caring for the meteorological records of the Signal Service and the performance of other work incidental thereto.

The following arrangement presents a general résumé of the character of the work carried on in the records division to June 30, 1888:

(1) The filing, classifying, and indexing of the meteorological records of the Signal Service.

(2) The control of the distribution of records for use in the several divisions of this office.

(3) The furnishing of general information and statistics to the public.

(4) The preparation of correspondence relating to all classes of voluntary meteorological observers.

(5) The preparation of charts and statistical matter on special subjects.

(6) Supervision of the elevations and exposure of instruments at all meteorological stations.

(7) The preparation of pressure, temperature, and precipitation normals.

(8) Supervision of tornado work.

(9) Preparation of marine data for daily cablegrams to the French Meteorological Office, and all correspondence relating thereto.

(10) The preparation of reduction tables.

(11) Correspondence with public institutions and individuals in search of meteorological and climatological information.

(12) The preparation of special reports on various subjects in meteorology and climatology.

(13) Meteorological study charts.

(14) The binding of meteorological records.

During the year ending June 30, 1889, the following duties have been added to those above indicated:

(1) The examination and verification of meteorological records from regular Signal Service stations.

(2) The preparation of all correspondence relating to the meteorological forms rendered by the regular observers of the Signal Service.

(3) The preparation of additional meteorological tables for the Monthly Weather Review.

(4) The verification of all reports from voluntary observers and the correspondence relating thereto.

(5) The proof-reading of meteorological tables for the Monthly Weather Review.

(6) The proof-reading of tri-daily meteorological charts and tables.

(7) The preparation of two large index maps (wall maps) to show the location and character of all meteorological stations under the immediate supervision of and co-operating with the Signal Service.

From what is thus presented paragraphically it will be seen that the work of the records division comprises not only the care of records, but an elaborate use of them in the compilation and discussion of the data they contain.

During the year special efforts have been directed to the careful verification of meteorological reports from all classes of voluntary observers. Previous to this time these reports were accepted as rendered by the observers, it being deemed sufficient that precaution was taken to furnish them with the usual instructions upon their accepting the position of voluntary observer.

It has been found, however, that the regular instructions must be followed up with the most careful examination of the monthly reports of daily observations.

It would naturally appear that observations already made and recorded would, after a lapse of 30 or 40 days, be difficult of verification by ordinary means, but having a knowledge of the distribution of temperature and precipitation for the different months of the year, and the advantage of the daily weather map with its carefully recorded observations from numerous stations, opportunity is afforded by comparison and giving proper weight to certain differences, to verify the observations with gratifying success.

This new duty has involved a large amount of labor and given opportunity to display considerable ingenuity and technical knowledge in measuring the correctness of thousands of reports coming from hundreds of stations scattered over the entire country.

The additional attention thus given these records has materially increased their value and stimulated the observers to better work, by showing that their reports were carefully watched and great importance attached to their accuracy and completeness.

In the work of arranging and classifying the records of past years there has been considerable delay owing to the occupation of new quarters by the Signal Office, but this hindrance is only temporary, and the increased filing space secured by the change will more than compensate for any difficulty occasioned thereby.

It is of the utmost importance to this office that the valuable meteorological records which it has been collecting for the past nineteen years should be placed in the most accessible shape for immediate use. This is one of the chief objects of the work of the records division, and very gratifying progress has been made in this direction during the past year. To put the voluminous records of the Signal Service in the condition here indicated involves something more than mere classification. The work embraces compilation of a varied character, the placing together of appropriate data, selection by comparison, the separation of a subject into its proper elements, the combination of elements for special purposes, grouping the same element with others for comparative study, and variation in the method of tabulating the same element.

All classification, indexing, and compilation is directed with the one paramount purpose in view, of placing the meteorological records in the best possible condition to aid by reference, or full examination, any special line of investigation conducted by the office with the least possible delay. The same may be said of inquiries made by the public, the variety and extent of which is constantly growing.

Not only must the records be arranged to secure convenience in using them, and expedite work where they are employed, but these advantages in the saving of labor and time must be supplemented by accuracy of clerical work if full benefit is to be realized from careful preparation.

To secure the last important result and stimulate activity in the direction of skillful and reliable work, a weekly check-list of errors has been kept for the past six months.

This list shows the number and character of errors made by each clerk in the various kinds of work upon which the clerical force are engaged. The errors thus found are not imputed, as formerly, to the division as a whole, and thus cast reflection upon the good and bad indifferently, but they are charged to those who made them.

By this plan individual merit is rewarded, those who would otherwise be indifferent and careless are stimulated to improvement and means afforded for quickly tracing the source of an error, the latter feature a very important matter in statistical work.

The experience already gained, since its establishment, enables the records division to anticipate in a measure the wants of the various divisions of this office in using meteorological data and also those of the public, and thus important requests are complied with more expeditiously.

Upon the completion of the card index of all classes of stations; the index map of "live stations;" the index map of "dead stations;" the compilation, indexing, arranging, and binding in volumes of meteorological data from regular Signal Service and voluntary observers, and the indexed classification of all forms in the records vault, the records will be in shape to accomplish the best results in their employment for any purpose for which they are usually required.

A more detailed statement of what appears in this introduction will be found under the following headings:

EXAMINATION OF FORMS.

Prior to January 1, 1889, the meteorological data from Signal Service stations, published and discussed in the Monthly Weather Review, were taken from the various forms and reports without verification. On the above date, however, the duty of examining and verifying all meteorological reports received from Signal Service stations was transferred to the records division, with instructions to verify the more important data and tabulate the same for publication by the 15th of the month succeeding that for which they were the record.

This was accomplished only through the utmost diligence and such supervision of the work as would require it to be completed in a thorough manner within the prescribed time.

The necessity for definite rules and instructions governing the examination of these forms soon became apparent and they were accordingly prepared and signed by the records and stations officers on March 18, 1889, a copy being filed in each division. In the establishment of these rules there is obtained a source of reference and decision that makes it no longer necessary to depend upon the memory of any one clerk as to the action taken upon an official paper.

The number of forms examined will be found in the summary appended hereto.

FILING AND BINDING RECORDS.

Careful attention is given to this matter in the records division, for the reason that in the handling of records for the purpose of compiling data, accurate and expeditious work depends largely upon the convenient and systematic arrangement and indexing of the forms in bound volumes.

The plan is to have all important and useful forms bound in the best manner and specially arranged in volumes for the use of the particular data. All forms not worthy of binding are stored for destruction as useless records.

The various meteorological forms received during the year have been properly filed, and those of importance will shortly be made ready for binding. Suitable facilities for filing current forms can only be had on completion of additional shelving in the records vaults, which improvement is sorely needed.

Seven hundred and eighty-seven volumes of records have been made ready for binding during the year and all but 202 volumes permanently bound.

The permanently-bound volumes are classified as follows:

	Vols.
Original manuscript weather charts	280
Anemometer record sheets	153
Temperature and rain-fall data	133
Miscellaneous	19
Total	585

Two hundred and twenty-two volumes of forms and charts in the hands of the Public Printer at the close of the last fiscal year were bound during the present year, making a grand total of 807 volumes bound during the year.

DATA FOR MONTHLY WEATHER REVIEW—REGULAR TABLES.

One of the most important and laborious duties performed in the records division is the preparation of tabulated data for the Weather Review. The work embraces not only compilation but the verification and proof-reading of the data. For a portion of the month every clerk in the division is required for the work, as the manuscript must be delivered to the printer on a certain date.

The following-named tables have been prepared monthly for publication in the Weather Review:

No. 1. Miscellaneous data from an average of 176 second and third order Signal Service stations.
No. 2. Temperature and precipitation data from an average of 1,350 stations. The number of stations included in this table has increased from 900 in July, 1888, to about 1,750 in June, 1889.
No. 3. Comparative maximum and minimum temperature at 72 selected Signal Service stations from July 1 to December 31, 1888. On January 31, 1889, this table was consolidated with Table No. 1.
No. 4. Excessive and greatest monthly precipitation at all stations whatsoever during the entire period of observations. This table, from January to June, 1889, inclusive, includes only the current excessive precipitation, the first six months of the year, embracing the record for the entire period of time covered by observations, having been published in 1888.
No. 5. Deviations from normal precipitation at an average of 48 voluntary stations.
No. 6. Deviations from normal temperature at an average of 48 voluntary stations.
No. 7. Temperature of water in certain harbors of the United States.
No. 8. Stages of water in certain selected rivers of the United States, 25 stations.
No. 9. Winds exceeding 50 miles per hour, other than maximum velocities.
No. 10. Monthly snow-fall and depth of snow at end of month.
No. 11. Excessive precipitation as recorded by self-registering instruments from March to June, inclusive, 1889.

SPECIAL TABLES.

No. 1. Supplementary data of excessive rain-falls, January to November, inclusive, embracing about 4,000 records. (December Review.)
No. 2. Summary showing the number of stations and average length of record for each State and Territory reporting excessive precipitation. (January Review.)
No. 3. Annual summaries of temperature and precipitation for 140 Signal Service and 22 voluntary stations. (January Review.)
No. 4. Temperature and precipitation at cotton-region stations for July, August, September, and October, 1888.
No. 5. Eighteen and fifteen year normal precipitation at an average of 235 stations in the United States. This series of charts began in May, 1888, and continued until April, 1889.

Ten miscellaneous tables of temperature and precipitation have been prepared and published at different times throughout the year.

LETTERS SENT AND RECEIVED.

Eighteen thousand eight hundred and fifty-two letters of all kinds, including those for the autograph signature of the Chief Signal Officer, were prepared and sent out during the year, an average of over sixty letters for each working day.

Four thousand three hundred and twenty letters were received and entered in the records of the division for action.

It is worthy of note that the number of letters sent and received has increased threefold during the year, due in a measure to the new work of the division, but generally to the increased interest of all classes of observers in their work and the demands of the public for information.

Attention is called to the fact that this very large correspondence has been conducted without an increase in clerical force, mainly through the use of stereotyped forms of letters, in which only the vital part of the letter need be written. Twenty-six forms of such letters were prepared during the year and are used in the daily correspondence of the division. The following is a brief description of them:

(1) Acknowledgment, current reports.
(2) Acknowledgment, miscellaneous.
(3) Acknowledgment, international.
(4) Tornado reports.
(5) Tornado reporters.
(6) Miscellaneous reports.
(7) Appointment of observers.
(8) Request to co-operate.
(9) New stations.
(10) Resignation of observer.
(11) Cessation of reports.
(12) Missing reports.
(13) Missing records.
(14) Hours of observation.
(15) Recording observations.
(16) Loan of instruments.
(17) Self-registering instruments.
(18) Appropriation for purchase of instruments for volunteer observers.
(19) Price-list, meteorological publications and instruments.
(20) Forwarding data.
(21) Transmitting Signal Service records.
(22) Deficient reports.
(23) Circular letter to persons who desire to become voluntary meteorological observers of the Signal Service.
(24) Request for co-operation as voluntary observer.
(25) New records.
(26) Miscellaneous observers.

DATA FOR PUBLIC USE—FROM THIS OFFICE.

Tables of mean monthly pressure and temperature for all Signal Service stations have been forwarded to the director of the meteorological service, Dominion of Canada, Toronto, Canada.

The Engineering News, of New York City, has been furnished monthly with a table of meteorological data of interest to engineers.

Reports of stages of water in certain rivers have been sent monthly to officers of the Engineer Corps of the Army as follows: Lieut. Col. C. B. Comstock, New York City; Maj. A. Mackenzie, Rock Island, Ill.; Lieut. T. A. Bingham, St. Louis, Mo.; Capt. Walter L. Fisk, Port Eads, La.

The Hydrographer, United States Navy, has been furnished weekly since May 1, 1889, with a copy of the cablegrams sent to the French meteorological office.

There have been furnished during the year to sundry persons, for use in courts of law, 63 transcripts of Signal Service records authenticated by the Secretary of War under the seal of the War Department.

One hundred and ninety-one tables and statements of miscellaneous meteorological data not certified, have been prepared and furnished for use of the general public.

FROM SIGNAL-SERVICE STATIONS.

Observers in charge of stations have produced their records as evidence in 79 suits at law.

Fifty-eight tables and statements of miscellaneous meteorological data have been prepared by the various observers for use of the public. This number is exclusive of the regular weather reports furnished daily and monthly to the public.

RECAPITULATION.

Certified statements furnished by this office for use in court	63
Station records produced in court	79
Miscellaneous tables or statements for publication, discussion, or research	96
Miscellaneous tables or statements for use in connection with commercial enterprises	93
For use of medical and other professional men in reference to the climatology of the United States	60
Total	391

COMPILED DATA.

In conducting the varied statistical work of the records division it has been found necessary to prepare from time to time separate records, in stub-file books, of certain meteorological phenomena, such as precipitation, by months and years, the maximum temperature by months and years, wind velocity, wind direction, etc. The stub-file books in which these data were formerly recorded accommodated but four years' record, a period altogether too limited for economical and expeditious work. Moreover, the arrangement of the data was not conformable to the present requirements of the service for quick and accurate work. Therefore, new record books were devised and the work of compiling the data therein has been commenced.

The old books containing data for 1888 are in the following condition, viz:

General summary or means book, completed.

Highest barometer; data entered and compared. Highest barometer from opening of station to include 1888, not completed.

Lowest barometer; data entered and compared. Lowest barometer from opening of station to include 1888, not completed.

Monthly range of barometer; data January to June entered.

Mean temperature; data entered and compared. Mean by months to include 1888, not completed.

Maximum temperature; data entered and compared. Maximum by months to include 1888, not verified.

Minimum temperature; data entered and compared. Minimum by months to include 1888, not verified.

Mean daily range of temperature; data entered, not compared. Monthly averages not computed.

Mean maximum temperature; data entered, compared, and monthly averages partially completed.

Mean minimum temperature; data entered, compared, and monthly averages partially completed.

Mean relative humidity; data for 1888 entered and compared. Monthly averages not made.

Monthly precipitation; data for 1888 entered, compared, and averages January to June completed.

Cloudless, partly cloudy, cloudy, and rainy days; data entered, monthly averages made and partially verified.

Average cloudiness; data entered, monthly averages made and partly verified.

Maximum velocity of wind, data entered and compared. Maximum velocity to include months of 1888, not determined.

Total movement of wind; data entered and compared. Monthly averages not made.

Number of times wind observed blowing from north, northeast, etc., data entered, not compared, and monthly averages not made.

WEATHER CABLEGRAMS TO EUROPE.

Since the date of the first dispatch (November 17, 1886) to the present time there has been no cessation in the daily preparation and transmission of weather cablegrams to Paris. Up to March 1, 1888, the same dispatch was cabled to both Paris and London, but since then only to the former city, for the use of the central meteorological bureau of France.

At first the dispatch contained both land and ocean data, the former embracing the United States and Canada, and the latter that portion of the North Atlantic between latitude 35° and 51° N. and longitude 45° and 70° W. On October 17, 1888, the marine portion of the dispatch was discontinued, but resumed again May 3, 1889.

The land data consist of barometric pressure (location of "highs" and "lows," with the formation and intensity of the latter), wind direction and force for the United States and at certain Canadian stations. The period of the land dispatch is for the twenty-four hours ending 8 p. m. of the day on which it is cabled.

The marine data embrace Greenwich noon observations of barometric pressure, wind and force; the occurrence of storms where the force of the wind is over 7 (22 to 40 miles per hour) Beaufort scale; and the location of icebergs and wrecks.

These data (marine) embrace a period of eight days, including the date of the dispatch, having been increased three days since May 3, 1889, when the period comprised but five days.

It has been ascertained by the French meteorological bureau that, although seven days elapse since the time of observation, the record will reach them by telegraph in time to be of value in the study of the development, form, and movement of atmospheric disturbances over the ocean.

The continuation of this work for nearly three years shows its usefulness in the study of ocean storms and those that reach the sea from the land.

This work is not alone of benefit to foreign governments, but is recognized as of value to the shipping interests of this country, because of the knowledge obtained of approaching weather changes by vessels leaving European ports for America.

The marine reports are received through the co-operation of the Hydrographic Office of the Navy Department, from its branch offices, in the principal seaport cities on the Atlantic coast.

During the year 365 dispatches were enciphered and cabled.

In order to reduce the cost of telegraphing, the cablegrams are written in a special form of cipher prepared for this purpose. The expense of the dispatches is borne by the French meteorological bureau, but the money, until recently, was disbursed by this office, owing to the failure of the Western Union Cable Company to make satisfactory arrangements with the French Government to "collect" on messages to Paris.

This difficulty is now (since May 10, 1889) overcome, through arrangements between the French meteorological bureau and the French Cable Company, whereby the cablegrams are sent "collect" to Paris. This plan relieves the Signal Office of all money responsibility in connection therewith and the keeping of accounts.

NEWSPAPER REPORTS.

In compliance with General Orders, Nos. 35 and 70, 1887, the records division receives all newspaper clippings forwarded by regular Signal Service observers, by voluntary observers, and from other sources. There have been received during the past year 2,077 packages of clippings.

Quite a large number of newspapers are also received at this office and the clippings made here.

Newspaper reports sometimes contain important meteorological data not otherwise recorded, and therefore of much value to the work of this office.

In general, however, the reports are duplicates, in a restricted sense, or so indefinite and inaccurate as to be of little statistical use. But even the vague reports have some value in that they afford the means of tracing up the more important details from some other source.

In this manner newspaper reports lead to the accumulation of important data and often form the connecting link where other means of information fail.

It has been a problem of some consideration as to what should be done in the way of establishing a permanent file of newspaper reports that should be easy of access and useful.

The old system of scrap-books, filled up indiscriminately, was a waste of labor and the source of great annoyance in making any examination of the records.

During the year 1887-'88 the plan of arrangement by subjects and indexing by months and years was tried, but without the success that was really expected.

During the past year the following plan was placed in operation: The daily weather maps for each month were bound in separate volumes, with a blank sheet the size of the maps inserted for each day, following the maps for that day. On these blank sheets are pasted the newspaper reports pertaining to the weather of the day on which the maps are published.

The newspaper reports are carefully examined and only the most important and reliable clippings are made use of. The remainder are destroyed.

By this plan all indexing and the use of special and costly record books are avoided. The data are in shape for immediate use and can be consulted in the easiest possible manner.

A ready comparison can be made between the reports made by the press and the regular charted and published reports of the service.

In this form the newspaper clippings have a permanent record and a permanent and important value.

TORNADO WORK.

During the year work under this head has been largely confined to the investigation of all classes of violent local storms, by sending specially prepared circulars of inquiry to people residing within and along the path of each storm. Accompanying the circular letters were blank forms with appropriate headings and columns whereon the answers to questions are recorded. Many excellent reports have been obtained from tornado reporters and all such matter has been sent to the review division for use in preparing the manuscript of the Monthly Weather Review on "local storms" for publication.

It seems desirable to again suggest the importance of arranging with tornado reporters to make what is known as "term day" observations. These special days are generally prearranged dates, determined upon months beforehand. But as this method of calculation for tornado occurrence can not be considered as practicable with the present length and accuracy of records, it seems desirable to resort to a somewhat different plan, as follows:

The special days of observation may be selected on the first appearance of what looks to be a cyclonic depression of marked intensity and gives evidence of being attended by violent local storms.

All observers situated in the probable course of the "low" (the southeast quadrant of it) should be notified by circulars of the approaching general storm and of the character and importance of the observations required. The circular will also state the number, time, and the period for which the observations will be made.

Of course, the best way to give this notice is by telegraph, but the expense attending the sending of the dispatches probably precludes any present hope of employing this wonderfully efficient factor in weather work.

By mail we can, in many cases, expect to reach stations as far west as the ninetieth meridian, south of the forty-fifth parallel, and give the observers from six to twelve hours' notice of the work desired of them.

Under such circumstances they would have from twenty-four to thirty-six hours to make observations, including those before and after the storm. Further eastward the opportunities would be greater for each observer.

The importance of these observations, being synchronous in time, uniform in character, and relating to the same general disturbance, but to different local actions, will, it is believed, fully warrant the preparation given to their collection.

There can hardly be a question but that the information thus obtained will produce an important fund of material for study.

The distribution of tornado circulars of inquiry during the past year has not only been useful in collecting valuable information concerning these storms, but has also been productive of much good in establishing new stations for the record of temperature and precipitation, and also in discovering the existence of old meteorological records of long periods and great value.

While but really a small amount of time can be given to tornado work, yet the results of this modicum of labor and interest are fully commensurate with the outlay.

In order that observers might exercise greater caution in reporting the occurrence of *tornadoes*, the following instructions were issued:

"SIGNAL OFFICE, WAR DEPARTMENT,
Washington, January 21, 1889.

"GENERAL ORDERS,
No. 2.

"I. In order to define more exactly the complex meteorological phenomena known as tornadoes, it is directed that hereafter no observer of the Signal Corps shall note in his official reports to this office any storm as a tornado, unless it shall be a violent local storm, in connection with which is noted (by day) a well-defined pendent, funnel-shaped cloud, with attendant rotary winds of sufficient violence, over a well-marked path, to uproot trees, prostrate dwellings, carry heavy objects long distances, or otherwise leave plain evidence of unusually violent and rotary wind currents.

* * * * * * *

"By order of the Chief Signal Officer.

"R. E. THOMPSON,
"*First Lieutenant, Sixth Infantry, A. S. O., Assistant and Adjutant.*"

ANNUAL REPORT TABLES.

General meteorological tables for the United States, as printed in the annual report of the Chief Signal Officer, pages 282 to 411, inclusive, were prepared in the division during the year. The character and extent of these tables are described as follows:

(1) Table of monthly normal temperatures and departures therefrom for 1887. Signal Service stations.

(2) Table of monthly mean temperatures for 1887. Miscellaneous stations, voluntary observers, military posts, State weather service, and railroad stations.

(3) Table of mean maximum and mean minimum temperatures for 1887. Signal Service stations.

(4) Table of mean maximum and minimum temperatures, May to October, 1887, inclusive. Cotton-region stations of the Signal Service.

(5) Table of maximum and minimum temperatures and yearly range at miscellaneous stations. Voluntary observers, military posts, State-weather services, and railroad stations.

(6) Table of monthly and yearly precipitation for 1887, all sources.

(7) Table of monthly maximum velocity of wind for 1887. Signal Service stations.

(8) Table of average hourly velocities of wind for 1867. Signal Service stations.

(9) Table of average cloudiness for 1887. Signal Service stations.

(10) Table of average number of clear, fair, cloudy, and rainy days since beginning of observations. Signal Service stations.

(11) Table of first and last killing frosts east of the Rocky Mountains. Signal Service and voluntary stations.

(12) Table of first and last snow-falls east of the Rocky Mountains. Signal Service stations.

(13) Table of mean relative humidity for 1887. Signal Service stations.

(14) Table of opening and closing of navigation 1887. Signal Service stations.

(15) Extremes of relative humidity in the United States.

(16) Fifteen stations having least daily differences of mean temperature for each month and the average by months.

(17) Extremes of average cloudiness and average number of clear, fair, cloudy, and rainy days.

CARD INDEX OF STATIONS.

The preparation of a card index, by States and Territories, of all stations in the United States from which meteorological reports have been received, was begun April 1, 1889. Thus far 240 cards have been wholly and 2,314 partially completed. When finished this index will afford easy and accurate reference to a succinct history of each station, and in conjunction with the wall index maps described below, will form a most comprehensive index of the meteorological stations and records of the Signal Service.

A sample card is given below:

SIGNAL SERVICE.

State, Arizona; county, Maricopa; station, Phœnix; latitude, 33 28 N.; longitude, 112 0 W.; elevation, ———. Date of opening of station, by order Nov., '73; obs. began †Feb. 6, '76; *January 1, '82; °July 26, '87. Order, †second, third,* repair.° Hours of observation, †7.35 a. m., 4.35 and 11 p. m., Wash. time; from Nov. 1, '79, at 7 a. m., 3 and 11 p. m., Wash. time; *sunset. Date of closing of station, †Dec. 31, '81; *last report, June, '87. Now repair—May, '89.

REMARKS.—°By order Feb. 17, '88, to take (special) daily rain-fall. None to April, '89. Record of exposed max.,* min., °wet, °humidity, wind, clouds, precipitation, and weather. Bar. record began January 13, '78; *Mar. 27, '79; °June 21, '77.

(Back of card.)

CLASSIFICATION OF STATIONS.

1. First order, making continuous records by means of self-registering instruments.
2. Second order, taking three or more observations daily.
3. Third order, taking one observation daily.
4. Special display (displaying cautionary signals).
5. Special river (taking stage of water in river) daily.
6. Special cotton-region (taking one observation daily).
7. Special rain-fall.

REFERENCES.

(*a*) Displays cautionary signals.
(*b*) Takes observations of the temperature of water in river or harbor.
(*c*) Takes observation of stage of water in river.
(*d*) Displays cold-wave signals.
(*e*) Displays weather and temperature signals.

WALL INDEX MAPS.

One of the most useful pieces of work completed during the year was the construction of two large index maps of meteorological stations, of all classes, in the United States. The first map embraces all of the "live" stations—those from which reports are now received; the second map represents the "dead" stations—those not now reporting but which have, at one time or another, rendered reports to this office. These maps show at a glance the distribution of stations in each State and Territory and present some interesting comparisons. The "live" map, for example, shows an area west of the Mississippi River aggregating 1,194,115 square miles with a total of 226 stations, or 1 station to each 4,500 square miles. Whereas the New England States with an area of 65,948 square miles have 173 stations, or one to each 376 square miles. The general average for all States east of the Mississippi River is somewhat below that for New England, but still greatly in excess of the average for all States west of that river. This numerical computation shows the opportunity and importance of continued energetic work in the establishment of temperature and rain-fall stations in the West.

The "live" map contains at present about 2,200 stations; the "dead" map is not wholly complete, only 700 stations having been located to date.

SPECIAL OBSERVING STATIONS.

These places of observation are classed as cotton-belt stations, special rain-fall stations, and special river stations. The observers are paid for their services as follows: cotton-belt, 20 cents per observation; special rain-fall, 10 cents, and special river 25 cents.

The following are the observations made by each class:

Cotton belt, daily observations of maximum and minimum temperature, and precipitation.

Special rain-fall: Daily observations of rain-fall.

Special river: Daily observation of stage of water in river, precipitation, wind direction and force, and weather at time of observation.

A careful and prolonged examination of the observations have been made, and the result does not give a very satisfactory showing regarding temperature and precipitation, especially the latter.

Previously the records from these sources were accepted without criticism, except to see that a record was made each day at the time set for each observation. As a result, the observers became indifferent to accuracy, and the value of their work suffered thereby.

With the new plan of carefully verifying each monthly report at this office and, where errors are found or suspected, writing the actual observer or the one in charge of the section center where the reports are collected, for explanation and correction, better results are attained and a reliable value given the observations.

With respect to the reports from cotton belt and river stations it is important to call attention to their broken records. While, of course, these stations are established for a particular purpose and in the interest of particular industries, which continue only for a portion of the year, yet to serve other important interests and for the general good it seems desirable that temperature and precipitation observations should continue throughout the year. The importance of a complete year's record can not be overestimated, especially when compared to a few scattering months.

If the temperature observations can not be continued the precipitation certainly ought to be, for we can illy spare rain-fall stations. In fact, it may be said with reason that there is no fear of our getting too many of them.

Owing to the dependence of precipitation upon locality, rain-fall stations can be much nearer to each other than in the case of temperature observations; yet where one is carried on the other can be continued without difficulty, and therefore the two kinds of observations should be combined where possible, and especially should they be continued throughout the year.

It is recommended that steps be taken to secure continuous records of temperature and precipitation at special observing stations, especially where they are situated as the only representative of a considerable area of country, say 50 miles square, or a single county. If a station is worth establishing for six or eight months it should be continued for the year.

REPORT ON FLOODS IN THE MISSISSIPPI RIVER AND ITS TRIBUTARIES.

On September 6, 1888, a special report was made for the use of the House of Representatives on the effect of impounding the rain and snow-fall in reservoirs in the mountains near the sources of the Arkansas and Missouri Rivers; on the floods of the Mississippi; also, to what extent the floods of the Mississippi are affected by precipitation in the Rocky Mountain region, and the direction of movement taken by the greatest rainfall, etc. In this report the effect of floods in the Missouri upon the Lower Mississippi, as shown by the records of the Signal Service, and the probable effect of impounding the rain and snow fall, as contemplated, were duly set forth. The subject of rain-fall in the several river valleys tributary to the Mississippi River, and its effect on that river, together with the times and frequency of great rises, was also discussed, and illustrated by a series of charts and tables.

RAIN-FALL CHARTS.

There were prepared during the year, for the use of the official in charge of rivers and floods, 24 charts of rain-fall for the years 1881 and 1882. These data relate to the catchment basin of the Mississippi River above St. Louis, Mo., including the Missouri River Valley, all of the States of Iowa, Missouri, Illinois, Dakota, Montana, Colorado, Wyoming, Minnesota, Wisconsin, western half of Mississippi, northern half of Alabama and Georgia, western half of North Carolina and South Carolina, eastern and northern parts of Texas, and that part of New Mexico in which the Canadian River lies.

SPECIAL PUBLICATIONS.

In accordance with Senate resolution of July 26, 1888, there were prepared in the division certain charts and tables relating to the climate of Oregon and Washington Territory.

In the preparation of these charts and tables the records of 61 stations in Oregon and Washington were carefully examined and verified, the monthly and yearly averages of temperature and precipitation computed, and the whole tabulated and arranged for publication. The percentage of rain-fall in each month of the year at 39 stations and the average daily variability of temperature at 24 stations were also computed and tabulated.

The completed work consists of 38 quarto pages and 8 charts (Senate Ex. Doc. No. 282, Fiftieth Congress, first session).

The publication of Senate Ex. Doc. No. 91, Fiftieth Congress, first session, on the "Rain-fall of the Pacific Slope and the Western States and Territories," was also completed during the year. The manuscript of this paper was prepared in the year 1887–'88. It consists, in printed form, of 101 quarto pages and 15 charts, and discusses records from 661 stations, aggregating a period of observations of 4,800 years, or an average of about seven years and three months to a station.

A list of typographical errors discovered in the above-named document was also prepared and published during the year.

METEOROLOGICAL OBSERVATIONS BY THE MEDICAL DEPARTMENT OF THE UNITED STATES ARMY.

The valuable co-operation of the Medical Department of the Army has been continued throughout the year. Reports have been received from an average of ninety-five stations, many of them in isolated and sparsely settled regions where it would otherwise be exceedingly difficult to secure observers.

As a material aid to the thoroughness of this work a new monthly meteorological register has been adopted by the Surgeon-General, which simplifies the labor required from observers but provides for the regularity and reliability of that which is furnished. There is less in quantity with a decided improvement in quality.

NEW VOLUNTARY OBSERVERS.

It has been found that a number of newly established voluntary stations, estimated at 12 per cent. of the total opened during the year, ceased reporting after a few months' work. This is to be regretted since it generally indicates a misconception on the part of the observer of the work required of him. It is therefore suggested that in future correspondence with prospective voluntary observers more emphasis be put upon the nature and extent of the duties required of them, and that they be requested to take observations for a period of at least one year where it is at all practicable to do so.

Without at least one complete year's record at a station the data, as a whole or in part, is of little or no value. It prevents the employment of seasonal and annual values and virtually destroys the record for any beneficial use.

Another difficulty in the way of securing voluntary observers at desirable points has been the reluctance of many persons to enter into personal bonds for the safe-keeping of the instruments intrusted to them. A new form of bond has been devised (given in full below) which it is believed will remove the objections made by many observers that the Government should, as far as possible, impose no restrictions in the loaning of meteorological instruments where the service of the observer is given free of cost.

PERSONAL BOND.

(To be in triplicate.)

Know all men by these presents that I, —— ——, of ——, county of —— and State of — —:

First. Hold myself personally and pecuniarily responsible for the safe custody of the Signal-Service instruments committed to my care, and for the return of the same when no longer needed for the purpose for which issued.

Second. That I promise to render a semi-annual report (viz, on June 30 and December 31), either by letter or on a form to be furnished for that purpose, of the condition of said Signal-Service instruments in my care to an observer of the Signal Service designated by the Chief Signal Officer of the Army.

Third. That I promise to make the observations specially agreed on and to render monthly reports thereof to the Chief Signal Officer of the Army.

Fourth. That I promise to pay the full value of any of the instruments which may be lost or damaged, through neglect or fault on my part, while in my possession or under my control, or to furnish the necessary certificate or affidavit showing the circumstances of the loss or damage when lost or damaged from unavoidable accident or other cause not within my control.

[Signature] —— ——.

I, —— ——, postmaster of ——, do hereby certify that ——, who signs the above bond, is personally known to me, and I fully believe him to be a responsible person, and that he will faithfully perform the obligation assumed by him in this connection.

[Signature] —— ——,
Postmaster.

In the loaning of instruments to persons wishing to become voluntary obeservers it has been found necessary to adopt some uniform plan of action in order to place the instruments where they will be of the most service. The following general rules have been applied during the year.

(1) Instruments will not be loaned to more than one station in a county, in any State or Territory, except where the distance between the proposed stations in any county exceeds 50 miles.

(2) The use of the word station in the sense above indicated means any place of observation where at least both temperature and precipitation are recorded and reported monthly throughout the year. The instruments employed may be either private or public property.

(3) Cotton region and special river stations are not to be considered in the establishment of voluntary stations, because the former only report for a few months of the year.

(4) In the issue of instruments the proximity of neighboring stations should not be given as much weight as the character of the observations furnished.

(5) A station using private instruments, but failing to render regular or reliable reports, should not prevent the establishment of another voluntary station in the same county, to be provided with Government instruments.

(6) A station using private instruments, but failing to report either temperature or precipitation should not prevent the furnishing of that station with the missing instrument, or even another station in the same county with thermometers and rain-gauge. But both stations should not receive Government instruments.

(7) Where Government instruments are to be loaned every effort will be made to secure the location of a station at the county seat, or other centrally located place, so as to provide for a better geographical distribution of rain-fall and temperature observations.

(8) When an observer having Government instruments wishes to discontinue observations the instruments should, if the location is a good one, be transferred, where practicable, to another observer at the same place. If the location is not favorable, then a better one in the same county should be obtained, if possible; otherwise transfer them to another part of the State where observations are desired and an observer can be obtained.

(9) That the instruments loaned by this office to voluntary observers be confined to one exposed thermometer, one maximum thermometer, one minimum thermometer, one wet-bulb thermometer, one rain-gauge, with proper supports.

(10) That the wet-bulb thermometer be furnished only in special cases where there is unquestionable evidence that the humidity observations can be made with advantage, either to this office or the particular locality, or both.

(11) That the exposed thermometer be not sent with the maximum thermometer, and the minimum thermometer, or *vice versa*, to the same station, unless there is positive evidence that some particular advantage will accrue either to this office or the particular locality, or both.

(12) That supports for rain-gauge be not furnished unless specially requested by the observer, and it is evident that failure to supply them will interfere with the regularity and accuracy of the reports.

VERIFICATION OF REPORTS FROM VOLUNTARY OBSERVERS.

A preliminary examination of the monthly meteorological reports received from voluntary observers during November, 1888, disclosed the fact that errors were frequently made by them in computing the sums and averages, in transcribing the monthly summary from the face of the form to the printed headings on the back of the form, and in recording temperature and rain-fall.

A plan of examination was therefore determined upon and applied to all classes of voluntary meteorological reports, beginning with December, 1888. The importance of the work to this service and to the voluntary observers can not be overestimated. It assures within the limits of possible error the placing on permanent record correct data for each station and also enables each observer, while the circumstances are fresh in his mind, to correct his reports and guard against similar errors in the future.

Thus far 6,135 reports have been examined. The greater number of errors noticed were due to inexperience and oversight, and it is gratifying to record the fact that, with but few exceptions, the observers have appreciated this interest in their work and cheerfully co-operated to accomplish the purpose of the plan.

The examination above referred to increased to a considerable extent the correspondence of the division, but by the use of circular letters the additional work was provided for without augmenting the clerical force.

VOLUNTARY OBSERVERS' RECORDS SUMMARIZED.

Summaries of 1,609 months of voluntary observers' records were made and entered in bound books for final record during the year. It has been impracticable, owing to press of other work, to give this subject more attention. It is hoped during the coming year to summarize at least several of the longest records in each State and Territory. The compilation here referred to embraces barometric pressure, temperature, precipitation, wind direction and velocity, cloudiness, weather, and local storms. When this work is finished it will be the most complete and useful abstract of the records of voluntary meteorological observers ever prepared in this country. One hundred and eighty-four volumes, for the permanent record of this information, are ready for immediate use and are distributed among the several States and Territories, as follows:

State.	Volumes.	State.	Volumes.
Alabama	4	Mississippi	3
Alaska	1	Missouri	6
Arizona	2	Montana	1
Arkansas	4	Nebraska	6
California	7	Nevada	2
Colorado	4	New Hampshire	3
Connecticut	4	New Jersey	4
Dakota	4	New Mexico	2
Delaware	1	New York	8
District of Columbia	1	North Carolina	3
Florida	3	Ohio	6
Georgia	4	Oregon	3
Idaho	1	Pennsylvania	6
Illinois	7	Rhode Island	1
Indiana	6	South Carolina	3
Indian Territory	2	Tennessee	4
Iowa	6	Texas	6
Kansas	6	Utah	1
Kentucky	4	Vermont	3
Louisiana	5	Virginia	2
Maine	3	Washington Territory	3
Maryland	3	West Virginia	3
Massachusetts	7	Wisconsin	3
Michigan	7	Wyoming	2
Minnesota	3	Miscellaneous	1

STATE WEATHER SERVICE REPORTS.

A brief summary of the monthly meteorological reports of each observer co-operating with the Signal Service, through State service, is received from the central office of the State director on Form 122 *i*, and tabulated for publication in the Monthly Weather Review. About 800 reports are received monthly from this source. Later the full summary is received on Form 184 *c*, or in the published report of the different State services. These reports are systematically arranged and bound for permanent use. At present there are on file the following bound reports:

Slations.	Date.	Volumes.	Stations.	Date.	Volumes.
		1			
Alabama	Apr., 1884, to 1887	1	Michigan	1877 to 1885	1
Arkansas	1887	1	Minnesota	Nov., 1884, to 1887	1
California	1870 to 1886	1	Mississippi	1884 to 1887	3
Colorado	1886 to 1887	1	Missouri	Dec., 1878, to 1887	1
Dakota	1886 to 1887	1	Nebraska	1878 to 1886	1
Georgia	1876 to 1886	3	Nevada (Carson City observatory).	1880 to 1886	1
Illinois	1878 to 1887	2			
Indiana	1882 to 1887	5	New England	Nov., 1884, to 1887	3
Iowa	1875 to 1883	1	New Jersey	1882 to 1887	1
Kansas	1876 to 1887	1	North Carolina	1886 to 1887	6
Louisiana	1884 to 1885	2	Ohio	1882 to 1887	1
Massachusetts (agricultural experimental station).	1884 to 1887	*1	South Carolina	1887	2
			Tennessee	Feb., 1883, to 1887	
Massachusetts (Blue Hill Observatory).	1885 to 1887	2	Total		44

*Annual.

Twenty-six municipal organizations and private institutions.

The following additional volumes have been sent to the bindery:

	Volumes.
Illinois	1
Indiana	1
Kansas	1
Nevada	1
New England Meteorological Society	2
South Carolina	1
Total	7

TEMPERATURE AND PRECIPITATION DATA.

For general use the two most important species of meteorological data are temperature and precipitation. The geographical distribution of these two elements and their variations, which may be traced to local causes, are intimately associated with the welfare of the public.

The majority of all requests for information involves the compilation and discussion of these data. Realizing the present importance of this matter and anticipating future needs, the records division has made earnest and laborious efforts to place the temperature and precipitation data in the most available condition for immediate use. Strong endeavor has also been made to thoroughly search the country for old and reliable records to supplement the data received from the regular observers of the service.

In this work the records division has been very successful. Below is given a list of places from which records of twenty years and upwards have been received:

Alabama, Green Springs; Arkansas, Washington; California, Alcatraz Island, Sacramento, San Diego, San Francisco; Connecticut. Canton, Middletown, New Haven, Thompson, Wallingford; Florida, Jacksonville, Key West; Georgia, Atlanta, Augusta; Illinois, Augusta, Chicago, Elmira, Peoria, Riley; Iowa, Dubuque, Fort Madison, Monticello, Muscatine; Kansas, Manhattan; Kentucky, Danville; Louisiana, New Orleans; Maine, Brunswick, Dennysville, Gardiner, Portland; Maryland, Baltimore, Cumberland; Massachusetts, Amherst, Cambridge, Fitchburgh, Mendon, New Bedford, Providence, Salem, Springfield, Worcester; Minnesota, Minneapolis, St. Paul; Mississippi, Natchez; Missouri, Bolivar, Harrisonville, Oregon, St. Louis; Nebraska, Omaha; New Hampshire, Concord, Hanover; New Jersey, Newark, New Brunswick; New Mexico, Santa Fé: New York, Albany, Buffalo, Cooperstown, Flatbush, Gouverneur, Jamaica, Newburgh, New York City, Palermo, Penn Yan, Rochester; Ohio, Castine, Cincinnati, Cleveland, College Hill, Hiram, Marietta, Portsmouth, Steubenville, Summit, Toledo, Urbana, Westerville; Oregon, Astoria; Pennsylvania, Cazmolia, Carlisle, Fallsington, Germantown, Gettysburgh, Morrisville, Philadelphia, Pittsburgh, West Chester; Rhode Island, Newport. Providence; South Carolina, Aiken, Charleston, Columbia; Tennessee. Clarksville, Memphis; Texas, Austin, Brownsville; Utah, Salt Lake City; Vermont, Burlington, Lunenburgh; Wisconsin, Beloit, Milwaukee, Embarrass, Manitowoc; District of Columbia, Washington.

The fact is not overlooked that these old records in some cases contained observations of rather doubtful accuracy. In such instances the data were carefully examined, corrections applied, and explanatory notes made to avoid the attachment of any fictitious value.

To place the temperature and precipitation data in convenient shape for the various uses to which they are applied a blank form was prepared, arranged by months and years, with space for name of observer and remarks.

Each blank affords space for the record of twenty years.

The records for each State and Territory are bound separately, in one or more volumes, according to the number of stations. Accompanying each station-record is a blank form upon which may be entered the sums and means for any period of two or more years, and preserve a permanent record of the compilation.

In this manner the data are collected and arranged to quickly serve important uses.

This summarizing of monthly mean temperatures and monthly precipitation has been continued throughout the year. At the close of the last fiscal year there had been copied from the voluntary records of the Signal Service, an amount equal to 249,950 months, and from the combined records published by the Smithsonian Institution, 494,084 months. There have been added to these during the year an amount equal to 250,110 months' record taken from the reports of State weather services, the Canadian meteorological service, special river and sunset stations of the Signal Service, and the current reports from all sources for the year.

One hundred and thirty-three volumes of these records were permanently bound during the year. It was found impracticable, however, to anticipate the needs of the work as regards the number of blank pages (data sheets) for new stations, to be put in each volume, and therefore some of the volumes have been found inadequate to supply the requirements of the present year. As a result, an additional volume for each State and Territory will soon be needed, which of itself shows the constant increase of this important information for the benefit of the public.

CIRCULAR LETTERS TO SIGNAL SERVICE STATIONS.

Ten circular letters have been prepared and sent to Signal Service observers during the year, on the following subjects:

(1) Discontinuing the practice of forwarding newpaper clippings with Form 112.
(2) Directing that newspaper clippings be not pasted on sheets of paper.
( ) Requiring additional precipitation data to be entered on Form 113.
(4) Requiring additional meteorological data to be entered on Form 119.

(5) Requiring certain wind data to be entered on the back of Form 103 and a monthly summary thereof to be made.

(6) Requiring a report on the custom of special river observers as to emptying the rain-gauge at special observations.

(7) Calling for a report on certain precipitation records and instructing as to proper manner of recording precipitation at special river stations.

(8) As to use of new Form 101, 1889.

(9) Designation of combined Form 101 and 113, 1889.

(10) Comparison of Form 4 from November 1870 to May, 1872.

INFORMATION FOR THE USE OF THE PUBLICATIONS DIVISION.

Special lists giving changes in address of observers, names and addresses of new observers, and names of observers who have resigned during the month, have been furnished monthly for the use of the publications division in the distribution of Signal Office publications.

Twelve lists have been prepared aggregating 1,056 names and stations of observation.

OBSOLETE FORMS.

In compliance with Signal Office memorandum No. 25, 1889, a report concerning the character and condition of official records in the files of the records division which have no permanent value and may be destroyed was submitted on February 20, 1889. In this report it was shown that Forms No. 16, 20, 24, 31, 106 bb, 107, 107 sub. 112 b, 112 c, 112 d, 117, 129 b, 129 c, 149, 151, 156, 164, 203, 225, Form c, and a large number of miscellaneous and duplicate records were no longer of practical value to the service and were occupying filing space needed for other records. It was not until June 25, 1889, however, that measures were taken to relieve the records vault of these forms, and thus far 19 boxes of obsolete forms and reports have been stored elsewhere, pending final action as to their destruction.

A proper use of the records vault requires the removal of these worthless papers.

THE RECORDS VAULT.

A fire-proof vault in the basement of the new Signal Office building, 2416 M street, 24 feet in width by 40 feet in length, was prepared during the early part of the fiscal year for the safe keeping of the meteorological records of the Signal Service. It has not yet been provided with suitable and sufficient shelving to properly store the large accumulation of records which it is intended to hold, and until such shelving can be provided there must, of necessity, be more or less confusion and delay in filling requisitions for records, and, moreover, they are fast becoming injured by dust and exposure. The necessity of immediate action to procure the needed shelving can not be too strongly urged.

SUGGESTIONS RELATIVE TO IMPROVED METHODS OF WORK.

To accomplish a greater measure of success in the work of the records division, and to increase the value of the meteorological reports from observers of the Signal Service, the following special recommendations were made and submitted to the Chief Signal Officer during the year.

(1) Preparation and publication of late voluntary meteorological reports in the Monthly Weather Review.

(2) For co-operation of Signal Service observers at certain seaport stations with Hydrographic Office, United States Navy.

(3) On the subject of special rain-fall stations and the publication in the Monthly Weather Review of reports therefrom.

(4) As to examination of thermograph curves and methods of recording hourly temperatures on Forms 118.

(5) Preparation of a new Form 101, original record of observations, by the use of which a considerable saving of labor is effected at this office and on stations; and the number of pages of records received annually from each station for file is reduced from 552 to 48.

(6) Preparation of Form 127 B, abridged annual summary, for publication in annual report of the Chief Signal Officer; effecting a saving of labor at stations and at this office.

e following-named forms were remodeled for the printing of a new edition : anemometer record sheet; Form 114, monthly river record; Form 119, monthly ical report (third order station); Form 140, abstract of daily journal; Form

144, monthly report of cotton-region observations; Form 165, hourly wind movement; Form 180, special rain-fall observer's report; Form 180 c, special rain-fall observer's report (repair station).

(8) On revision of "instructions to special river observers."

(9) On the use of memorandum blank for transmitting post hospital meteorological reports to Surgeon-General's Office for correction of errors found therein.

REPORTS ON SPECIAL SUBJECTS.

The following reports were rendered in compliance with special directions from the Chief Signal Officer:

(1) Translation of certain extracts from French and German publications.

(2) Report on changes necessary in preparing the daily cable dispatch to Paris (two reports).

(3) On the advisability of considering, at the International Marine Conference, the employment of a code of two elements (the English Morse alphabet) for the communication of information.

(4) On the adoption of the American Morse alphabet for signaling and the abolition of the "front" motion (two reports).

(5) Recommending that action be taken to prevent the obliteration of lower part of table printed on right hand side of the daily weather map.

(6) On the sending of special telegrams from Signal Service stations indicating large and rapid changes in pressure.

(7) On rain-fall observations in the West relative to methods of irrigation. Report called for by the Secretary of War for the use of Congressional committee having the subject in charge.

(8) Report on errors in September, 1888, Weather Review.

(9) Report on the arrangement of tabulated matter in Senate Ex. Doc. No. 91, Fiftieth Congress, first session, The rain-fall of the Pacific slope and Western States and Territories.

(10) Report on the necessity of specific instructions for the examination of meteorological forms from Signal Service stations.

(11) Report on the uniformity of lettering meteorological forms.

(12) Report on continuing meteorological observations at cotton belt and river stations throughout the year.

(13) On newspaper clippings received from Signal Service stations (two reports).

(14) On instructions to observers as to the character of storm to be designated a tornado.

(15) On temperature normals from maximum and minimum temperatures for Signal Service stations.

(16) On precipitation normals at certain stations in Texas.

(17) Report on temperature of January, 1889, by Mr. A. J. Henry, chief clerk of records division.

(18) On the distribution of publications to voluntary observers.

(19) Report on the character and condition of official records in the files of the records division.

(20) Report on the distribution of meteorological forms to Signal Service stations.

(21) Report on the distribution to voluntary observers of Senate Ex. Doc. No. 282, etc., and Senate Ex. Doc. No. 91, "Rain-fall on the Pacific slope and in the Western States and Territories."

(22) Report on nature of duties performed in records division.

(23) Report on binding the meteorological forms of the records division.

(24) On the printing of a memorandum blank for the use of this office in referring communications to other Bureaus of the Government for necessary action.

BOARD MEETINGS.

The records officer has performed duty as a member of the following boards, convened by order of the Chief Signal Officer:

(1) Board of survey on certain property for which the late Second Lieut. L. E. Sebree, Signal Corps, was responsible.

(2) Board of survey on certain property for which Second Lieut. W. A. Glassford was responsible.

(3) Board on combination Form Nos. 101 and 113, for Signal Service stations.

(4) Board on promotion of Signal Service sergeants and corporals.

(5) Board on the opening of bids for supplies to Signal Service stations and to the office of the Chief Signal Officer.

Statement showing the amount of work (susceptible of tabulation) done in the records division during the year ending June 30, 1889.

Voluntary records:	
Rain-fall and temperature data tabulated; number of months' record	250, 110
Rain-fall and temperature data compared; number of months' record	363, 705
Monthly summaries made and entered in books	1, 609
Daily mean temperatures computed	28, 422
Meteorological tables for use in Signal Office:	
Review division	132
Annual report (1888)	17
Miscellaneous	22
Data for the public:	
Certified	63
Not certified	79
Miscellaneous tables and statements	249
Letters:	
Sent	18, 852
Received	4, 320
Filing and issuing records:	
Received and filed (estimated)	176, 630
Issued on requisition	6, 899
Returned to file and charge removed	15, 656
Cablegram work:	
Reports prepared for transmission	715
Copies of messages made for Professor Mascart	365
Copies of messages made for Hydrographer, U. S. Navy	59
Tornado work:	
Circulars of inquiry sent	3,113
Reports received	650
Proof read and revised:	
Review tables	72
Pages of Annual Report of the Chief Signal Officer	209
Pages of Senate Ex. Doc. No. 91, Fiftieth Congress, first session	101
Pages of Senate Ex. Doc. No. 282, Fiftieth Congress, first session	37
Pike's Peak data, months of	67
Miscellaneous:	
Volumes prepared for binding	787
Tornado circulars No. 1 sent out	8, 776
Newspaper clippings received, packages of	2, 077
Pages copied in letter-press books	3, 959
Recommendations to loan board	316
Index cards completed	240
Meteorological forms examined	37, 147

Report of Assistant Professor H. A. Hazen.

(1) Current work on the determination of elevations of stations by railroad or precise levels, and by barometer. Adjustment of all changes of level at stations. A table giving latitude and longitude and heights of all stations on January 1, 1889, and changes since that date will be found in Appendix No. 16.

(2) Preparation of tables of reduction of barometer readings and dew-point tables.

(3) Preparation of normals of temperature and pressure for the forecast and records divisions. Since January 1, 1889, two sets of normals of temperature have been used: First, for the forecast division computed for 8 a. m. from the previous 7 a. m. normal, and at 8 p. m. from the previous 10 p. m. by allowing the change due to the position of the sun and the effect that would have on the diurnal change. These normals have proved quite satisfactory for stations east of the Mississippi; but for stations in the plateau region and on the Pacific coast the 8 p. m. normal has been found slightly too low, and that too small an allowance had been made for the diurnal range. These corrections have now been made. Second, for the records division it has been decided that a normal computed from the mean of the mean maximum and minimum temperatures should be used and compared with the mean of the same temperatures month by month.

(4) General discussion of all the temperature observations since 1871 with an attempt at reducing them to uniformity.

(5) Forecasts made for July, December, 1888, March and June, 1889, with reports regarding these.

(6) Completion of tri-daily charts to the end of June, 1888. Proofing tri-daily charts for June, 1878.

(7) Preparation of tables: Mean monthly pressure and temperature at Canadian stations; tables of special and late observations; tables and charts giving the mean temperature as computed from several combinations of hours.

(8) Completion of "glossary" of meteorologic terms.

(9) Preparation of "Weather Review" for October, 1888.

(10) Preparation of Pike's Peak daily observations; hourly wind movement and abstract journals; reading proof for all the daily observations and a few months of the wind records.

(11) Special reports have been made, the more important of which are as follows:

(*a*) Hot winds of the Western country.
(*b*) On a self-register for Cooke's radiometer.
(*c*) The proper temperature to be used in reducing barometer readings to sea-level.
(*d*) On an Atlantic balloon voyage.
(*e*) On a new thermometer shelter.
(*f*) On the humidity of New York City.
(*g*) Rain-gauge exposure, especially at the new Signal Office.
(*h*) On the effect of wind on a water surface.
(*i*) On a criticism of weather predictions.
(*j*) Rain-fall at Lansing, Mich.
(*k*) Soil temperature.
(*l*) On an alleged discovery of a law of cyclonic evolution by experimenting with a furnace.
(*m*) On the effect of the moon on wind.
(*n*) Equinoctial storms.
(*o*) On solar radiation and its dependence upon positions of low and high areas of pressure.
(*p*) Climate of Puget Sound.
(*q*) Shower of snails.
(*r*) On electricity observed on Beaver Hill, Wyoming.
(*s*) On meteorologic observations from Havana.
(*t*) On proposed observations at Mount Washington.

Special studies have been made on the use to be made of the dew-point in weather forecasts, and a short article has been published in Science for January 25, 1889; on the "Formation of Dew," an article on which was published in American Meteorological Journal for September, 1888. On "Movement of Upper Air Currents," see Journal Franklin Institute, July, 1888, and American Meteorological Journal, September, 1888. On "Tornadoes," see Science," February 15, 1889. On "Measurement of Wind Velocity," see Science, March 22, April 5, 1889, and American Meteorological Journal, March, 1889.

Special experiments have been instituted for examining the general question of cloud, fog, and rain formation, which are still continued. Short articles on this subject have been published in Science, May 10 and June 21, 1889; also in Scientific American supplement, June 15, 1889.

Respectfully submitted.

JNO. P. FINLEY,
Second Lieutenant, Signal Corps, Records Officer.

APPENDIX 6.

ANNUAL REPORT OF THE OFFICER IN CHARGE OF THE EXAMINER'S DIVISION.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington, June 30, 1889.

SIR: I have the honor to report that the work of the examiner's division has continued uninterruptedly during the fiscal year ending on this date, under the charge of First Lieut. Robert Craig, Fourth Artillery, until September 30, 1888, and from thence under the charge of Second Lieut. Frank Greene, Signal Corps, to the present date, except during the temporary details of Second Lieut. F. R. Day, Signal Corps, and Second Lieut. F. M. M. Beall, Signal Corps, in the absence of Lieutenant Greene upon inspection duty.

The working force of the division has averaged three clerks, one being the chief clerk, with some temporary details at times when the work was found running behind. The enlisted portion of the clerical force was changed to civilian on October 2, 1888, pursuant to the provisions of the act of Congress making appropriations for the sundry civil expenses of the Government for the fiscal year ending June 30, 1889. The change was conducted without friction or any interruption of the work.

With a view to simplifying the work of the division and reducing the amount of labor, the practice of entering letters of transmittal, statements of public funds, and certificates of deposit as letters received was discontinued on October 6, 1888, since which time such papers have been designated, respectively, L. T., P. F., and C. D., given a number, and entered in their respective books in serial order, without briefing.

Under the provisions of the act of Congress approved October 12, 1888, and the regulations for the care, preservation, and accountability of Signal Service property (based on that act), which regulations were approved by the Secretary of War on November 1, 1888, the returns of signal property of all descriptions, which had previously been made quarterly, are now made semi-annually, and after passing the administrative scrutiny of this office are no longer forwarded to the Treasury for further examination and file, but are retained and filed in this office; and the officer, enlisted man, or other agent of the Government who is responsible for property is, upon rendition of the final return, which has been found correct, furnished with a clearance in the form of a letter specifying the receipt and examination of final returns, and that property accountability at the station is thereby closed. A similar statement of the closure of accountability for property is also furnished the mustering officer of the Signal Corps upon the discharge of each enlisted man and prior to the issuance of his final statements.

The average number of property accounts of acting signal officers, enlisted men, and other agents of this service is in the neighborhood of four hundred; the average number of final returns consequent upon the relief of officers and others is in the neighborhood of one hundred and fifty during each six months of the year; so that during the course of the year there will be nearly eleven hundred separate property accounts to be examined and settled in this office. The labor consequent upon the examination of this large number of accounts, with the great amount of correspondence which is found necessary in the settlement of errors, both large and small, taken together with the current work of the office, which includes the examination of the accounts current of the disbursing officer of this service, and their voluminous vouchers, the accounts current for line receipts of the different officers in charge of divisions of the United States military telegraph lines, the scrutiny of the weekly and monthly statements of public funds, and the checking of certificates of deposits and various papers connected with the various returns, is such an increase over the amount of work formerly performed in this division that it seems to me that the present working force of the division will be found inadequate to keep the work up to date. When it is considered that the examination in this office of property returns representing large sums of money is, under the present law, the final one, the necessity for the utmost exactness and accuracy is apparent. I am of the opinion that one more experienced clerk should be detailed for duty in the division.

I take great pleasure in commending the valuable service of Mr. James B. Newlin, the chief clerk, and of his subordinates.

Very respectfully,

FRANK GREENE,
Second Lieutenant, Signal Corps Examiner.

The CHIEF SIGNAL OFFICER.

NOTE.—A summary of the work performed is appended hereto.

Summary of work performed in examiner's division, office of the Chief Signal Officer, during the fiscal year ending June 30, 1889.

Papers of all kinds received, including accounts current, letters, returns, vouchers, statements, etc	21,615
Letters received, briefed, and recorded	1,423
Letters of transmittal received, numbered, indexed, and filed	681
Weekly and monthly statements of public funds, and semi-monthly reports of other lines telegraph funds, received, verified, and recorded	438
Certificates of deposit received, scrutinized, recorded, indorsed with proper appropriation, and returned to the Treasury	195
Letters sent	2,521
Property returns examined and disposed of	738
Accounts current examined and disposed of	166
Vouchers to property returns and accounts current examined	20,247
Leases received and recorded	57
Office memoranda written in regard to the transaction of the business of the division	494

APPENDIX 7.

REPORT OF DISBURSING DIVISION.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, July 26, 1889.

SIR: I have the honor to submit the following report of the disbursing division for the fiscal year ending June 30, 1889:

PERSONNEL.

Under Special Orders, No. 28, dated headquarters of the Army, Adjutant-General's Office, Washington, February 2, 1889, I reported for duty as property and disbursing officer for the Signal Service (relieving Capt. Francis B. Jones, assistant quartermaster), and assumed the duties of the position on March 1, 1889.

On October 4, 1888, in view of the reorganization of the office, provided for by the act of Congress approved October 2, 1888, Mr. William R. Bushby, who had virtually filled the position since April 1, 1883, was formally appointed chief clerk of the property and disbursing division, and Mr. Francis K. Van Auken was announced as contract clerk and assistant chief clerk of said division.

On March 1, 1889, the name of the division was changed from property and disbursing division to disbursing division, and the title of the officer in charge from property and disbursing officer to disbursing officer.

CLASSIFICATION OF WORK.

For administrative purposes the work of the division is classified and apportioned among several subdivisions or sections, as follows:

(1) Contracts section (one clerk of class 3, three clerks of class 1, and one clerk, $900). The preparation of all specifications and advertisements for supplies; estimates for appropriations; orders and letters authorizing expenditures at stations; contracts and leases.

(2) Correspondence section (two clerks of class 1, and two clerks, $1,000.) Briefing and indexing of all letters received, and the writing, recording, and mailing of all letters sent.

(3) Library section (one librarian, $1,600). The custody of the books, the cataloguing of the same, and the keeping of the accounts of the receipts and issues of them, and the work of preparing a general meteorological bibliography. (This section was transferred from this division and assigned to the office of the chief clerk on July 1, 1889.)

(4) Mechanic's section (one chief mechanic, $1,200; three skilled artisans, $840; and one carpenter, $660). The manufacture, repair, and modification of instruments and equipments; the making of shelving, and general office repairs. (The machine-shop branch of this section, consisting of one chief mechanic, $1,200, and two skilled artisans, $840, was transferred to the instrument division on July 1, 1889.)

(5) Police section (includes all messengers, laborers, watchmen, and charwomen). The carrying of packages from one room to another; the cleaning of approaches, halls, stairways, rooms, and other police duty, and the guarding of the premises.

(6) Property section (two clerks, $1,000; two clerks, $900). Invoicing of all property sent; requests for transportation of property; preparation of abstracts of property received, expended, and issued, and the preparation of the returns in connection therewith.

(7) Settlement of accounts section (five clerks of class 1, and three clerks, $1,000). The examination, preparation, and settlement of all accounts against the office, including the settlement of the accounts for the commutations of the enlisted men of the Signal Corps; the preparation for settlement of the pay accounts of the civil employés on duty in the city of Washington; the preparation of the money accounts of the disbursing officer, including abstracts and accounts-current; the comparison and correction of vouchers for submission to the Chief Signal Officer, and the proper record of all receipts and expenditures of money and condition of the appropriations.

(8) Storekeeper's section (one clerk of class 1; one clerk, $1,000; one clerk, $900; one skilled artisan, $840; one messenger, $840; and one laborer, $660). The receiving, packing, and shipping of all supplies and the proper record of all receipts and issues; the making of packing-boxes for the shipment of supplies.

SALES OF PUBLICATIONS.

Three hundred and sixty-seven dollars and three cents have been received during the year from sales of maps and bulletins, as allowed by act of Congress approved March 30, 1874, section 227, Revised Statutes. The amount received was deposited with the Treasurer of the United States to the credit of the appropriation "Observation and report of storms."

ACCOUNTS SETTLED.

The number of accounts, including those for the commutations due enlisted men, growing out of the disbursements of the various appropriations expended by this office settled during the year, are 11,231, distributed as follows:

July, 1888	1, 211	January, 1889	1, 049
August, 1888	1, 042	February, 1889	787
September, 1888	836	March, 1889	701
October, 1888	1, 169	April, 1889	1, 050
November, 1888	1, 053	May, 1889	743
December, 1888	848	June, 1889	732

On June 30, 1889, there were 89 unsettled accounts in the division, most of which had been received during the month.

ADVERTISEMENTS AND PROPOSALS.

During the year there were issued 296 advertisements (in the shape of circulars) inviting bids. There were 563 abstracts of bids made up in duplicate, or 1,126 single abstracts.

SUSPENSION OF ACCOUNTS.

Several difference sheets, referring to accounts of Capt. Francis B. Jones, were received during the year.

Replies have been made covering all accounts suspended up to date, and notification has been received from the Third Auditor that the explanations were satisfactory, and that the differences had been adjusted.

INSTRUMENTS PURCHASED FOR OFFICIAL USE AND ISSUED.

Nine hundred and seventy-three instruments of various kinds have been purchased during the year for the use of this service, and 2,384 have been issued since last report. There were also issued during the year to voluntary observers 1,048 instruments, mostly thermometers and rain-gauges, the aggregate cost of which was $2,745.18.

COST OF STATIONS OF OBSERVATION.

The average cost of maintaining each regular meteorological station during the year (exclusive of the cost of telegraph service and the pay and allowances of the enlisted force on duty at each), has been $301.38. The station costing the least is Shreveport, La., $2.25 only having been expended thereat during the year; the station costing the most is Chicago, Ill., at which the sum of $1,104.34 was spent during the year.

From past experience it has been found that the average cost of establishing and equipping a regular meteorological station and maintaining it for one year is $1,000, distributed as follows:

To establish:	
Erection of instruments, etc	$150. 00
To equip:	
Instruments	237. 63
Furniture	181. 37
Supplies	100. 00
	519. 00
To maintain for one year:	
Rent	180. 00
Light	25. 00
Fuel	40. 00
Civilian employés	36. 00
Other expenses	50. 00
	331. 00

CORRESPONDENCE.

The total number of letters received during the year were 22,280, containing 44,849 inclosures.

The total number of letters sent were 26,919, which includes 1,463 indorsements.

RECEIPTS AND SHIPMENTS.

In the packing and shipping room there were 8,211 distinct shipments made through the Quartermaster's Department, by mail and by express, and there were 629 consignments received.

MACHINE-SHOP.

The usual quantity of work has been done in the machine-shop, in the manufacture and repair of instruments and in repairs about the office. It, however, has been your policy to confine such work to small jobbing and repairs, and to have all large jobs done outside after due advertisement and an opening of bids; this being also rendered necessary on account of the limited force employed in the shop and the character of the work to be done.

CARPENTER-SHOP.

In the carpenter-shop almost all the boxes for shipment of supplies have been made, and jobbing and repairs about the office have been done, and the men employed therein have been kept busy during the year at such work.

LIBRARY.

The library has received during the year, by purchase, exchange, or gift, 791 volumes, and now contains 11,111 volumes, exclusive of pamphlets, which, although catalogued, have never been numbered as books.

The preparation of those portions of the Signal Service card-catalogue of meteorology relating to temperature and moisture has occupied the time of the library force during the greater portion of the fiscal year just closed. Part I of the Bibliography, relating to temperature, was issued during April in a quarto lithographed book of 381 pages. Part II, relating to moisture, is now being lithographed.

The necessary current work of the library has been kept up to date, beyond which little could be done, owing to the amount of time required in the preparation of the card catalogue for the lithographer.

APPROPRIATIONS.

The condition of the appropriations (disbursed by this office) for the fiscal year ending June 30, 1889, with the expenditures thereunder and the balances, with probable demands on such balances, report of which is required to be rendered by the act of Congress approved May 20, 1820, is as follows:

Appropriated:	
Observation and report of storms	$238,200.00
Signal Service:	
Regular supplies	48,082.96
Incidental expenses	775.17
Transportation	22,150.00
Barracks and quarters	63,861.83
Subsistence	116,375.58
Medical department	2,700.00
Signal Service of the Army	5,000.00
Expended:	
Observation and report of storms	233,160.91
Signal Service:	
Regular supplies	38,459.43
Incidental expenses	216.07
Transportation	22,008.47
Barracks and quarters	63,008.36
Subsistence	111,085.20
Medical department	2,474.40
Signal Service of the Army	5,000.00

Balances:	
Observation and report of storms	$5,039.09
Signal Service:	
Regular supplies	9,623.53
Incidental expenses	559.10
Transportation	141.53
Barracks and quarters	853.47
Subsistence	5,290.38
Medical department	225.60
Signal Service of the Army	
Probable demands:	
Observation and report of storms	1,539.09
Signal Service:	
Regular supplies	223.53
Incidental expenses	59.10
Transportation	88.93
Barracks and quarters	453.47
Subsistence	790.38
Medical department	225.60
Signal Service of the Army	

Amounts appropriated under the different heads for the support of the Signal Service, U. S. Army, for the fiscal year ending June 30, 1889.

Legislative, executive, and judicial:		
Regular clerks and messengers		$40,660.00
Rent of buildings for Signal Office		7,500.00
Printing and binding		10,000.00
Postage-stamps (allotted by Secretary of War)		834.15
Stationery (allotted by Secretary of War)		3,823 32
Contingent expenses (allotted by Secretary of War)		6,348.23
Sundry civil expenses:		69,165.70
Clerks, messengers, and laborers		85,875.00
Observation and report of storms:		
Manufacture, purchase, etc., of instruments	$3,000.00	
Telegraphing reports	125,000.00	
Expenses storm signals	10,000.00	
Instrument shelters	500.00	
Rents, etc., of offices outside of Washington	45,000.00	
River and flood reports	9,000.00	
Maps and bulletins	15,000.00	
Cotton-region reports	7,000.00	
Maintenance and repair of military and sea-coast telegraph lines	23,700.00	
		238,200.00
Pay, etc., of the Signal Corps:		
Pay of officers	32,015.18	
Pay of enlisted men	153,870.08	
Commutation of quarters to officers	4,942.58	
Mileage to officers	2,882.19	
		193,710.03
Subsistence Department:		
Subsistence and commutation of rations		116,375.58
Quartermaster's Department, Signal Service:		
Regular supplies—		
Fuel for offices and for sale to officers	6,745.20	
Commutation of fuel to enlisted men	37,908.39	
Forage for public animals	1,853.60	
Forage for officers' horses	1,365.00	
Straw for public animals	101.57	
Straw for officers' horses	109.20	
		48,082.96
Incidental expenses:		
Shoeing public animals	268.81	
Shoeing officers' horses	234.00	
Blacksmith's supplies	100.00	
Veterinary supplies	35.10	
		637.91

Interment of officers and men		$137.26
Signal Service:		
Transportation—		
Men, material, and funds	$22,000.00	
Harness, and repairs to means of	150.00	
		22,150.00
Barracks and quarters		63,861.83
Medical department:		
Medical attendance and medicines to officers and men		2,700.00
Signal Service of the Army		5,000.00
Grand total		845,896.27

CLERICAL FORCE.

On July 1, 1888, there were employed in this division 73 persons, 40 enlisted men and 33 civilians; the 73 employés being distributed as follows: clerks, 25 enlisted men and 5 civilians; mechanics, messengers, and laborers, 15 enlisted men and 28 civilians.

On June 30, 1889, there were employed in this division 68 persons, 3 enlisted men and 65 civilians, the 68 employés being distributed as follows: Clerks, no enlisted men and 25 civilians; mechanics, messengers, and laborers, 3 enlisted men and 40 civilians.

By the sundry civil act approved October 2, 1888, it was provided "that any person performing duty in any capacity as Officer, clerk, or otherwise, in the office of the Chief Signal Officer at the date of the passage of this act, who has heretofore been paid as an enlisted man in the Signal Corps and whose office employment or place is specifically provided for herein under the direction of the Secretary of War may be continued in such office, clerkship, or employment," etc.

TELEGRAPH LINES.

The number of miles of telegraph line sold during the year is 273; amount received for same, $135.50, which was properly deposited as required by regulations.

PROPERTY RESPONSIBILITY.

During the fiscal year ending June 30, 1887, an effort was made to transfer to the enlisted men of the Signal Corps the absolute responsibility for all public property at the stations at which said men might be serving and thus relieve the property and disbursing officer from carrying on his returns vast quantities of property, most of which he had never seen. The plan submitted was in analogy to that in force in the Ordnance Department. The matter was submitted to the honorable the Secretary of War, who referred it to the Judge-Advocate-General for an opinion, and that officer, while fully realizing the fact that the disbursing officer of this service should be relieved, yet felt constrained to decide against the plan, for the reason that Congress alone, by special legislation, could transfer the responsibility for public property to an enlisted man.

On March 8, 1888, the matter was again brought to the attention of the War Department, and a draft of an act (analogous to section 1167 of the Revised Statutes, which governs in the Ordnance Department) was submitted, with the request that the matter might be brought to the attention of Congress; the War Department most favorably considered the request, and a bill (H. R. No. 9907) was, on May 8, 1888, reported by Mr. Townshend, from the Committee on Military Affairs, which was approved and became a law on October 12, 1888. On October 29, 1888, there was submitted to the honorable the Secretary of War, for his approval, in accordance with the terms of said act, a draft of "Regulations for the care, etc., of Signal Service property," which being approved by him on November 1, 1888, the regulations were at once promulgated.

The transfer of the property to the enlisted men was effected on December 31, 1888.

OFFICE AND STORAGE ACCOMMODATIONS.

On February 25, 1888, H. R. No. 4359 was passed, appropriating the sum of $150,000 for the purchase of a site (the northeast corner of square No. 25, bounded on the north by M street, on the east by Twenty-fourth street, and on the south and west by the grounds of the Columbia Hospital), including the building thereon; also, for the erection of the necessary store-houses for the use of the office of the Chief Signal Officer.

The additional buildings required were erected under the direction of the Supervising Architect of the Treasury, and on March 5, 1889, this office was advised that the work on the Signal Office buildings had been practically completed, and that the superintendent of construction had been formally directed to transfer the custody of said buildings to the War Department.

It was, however, deemed proper before accepting the building to ask the honorable the Secretary of War that the superintendent of the State, War, and Navy Department Building, assisted by Prof. C. F. Marvin of this service, and some other person, be designated a board to examine the building with a view of determining whether it was in accordance with the contract. This request was approved by the Secretary of War and Mr. Bernard R. Green, civil engineer, was appointed as the third member of the board.

The report of the board justified the action of this office, for, as a result of the examination, the building was found, both in the materials used and in the workmanship, to be inferior to what was contemplated by the specifications, and, although it has been occupied, it has not as yet been formally accepted.

It is believed that considerable repairs will be necessary during the coming year to keep it in a habitable condition.

More storage room is needed. To secure the same, additional buildings should be erected as recommended below; the present stables and carriage house should be converted into store-rooms, and a suitable stable rented.

CONTRACTS.

As required by the act of Congress approved April 21, 1808 (Statutes at Large, vol. 2, p. 435), I submit herewith list of contracts made by this division during the fiscal year ending June 30, 1889:

With whom made.	For what purpose.
J. A. Klein	Construction Point Reyes Telegraph Line.
Rider & Addison	Roller composition.
Frank Palmer	Lease of office, Fort Totten, Dak.
Rider & Addison	Miscellaneous supplies.
R. A. Robbins	Do.
Burke & McFetridge	Engraving charts.
Bismarck Coal and Wood Company.	Fuel.
	Lease of office:
Rhode Ely	Fort Washakie, Wyo.
Maude R. Shaw	Valentine, Nebr.
Rouse & Blackwelder	Wichita, Kans.
L. N. Heil	Montrose, Colo.
Chas. E. Gast	Pueblo, Colo.
Heiskell & McLeran	Washington, D. C.
Henry Ash	Palestine, Tex.
Davidson & Springs	Charlotte, N. C.
T. J. Allen	Valentine, Nebr.
Geo. H. C. Neal	Baltimore, Md.
L. G. Nesmith	San Diego, Cal.
First National Bank, by Otto Fowle, president.	Sault de Ste. Marie, Mich.
Leonard & Montgomery.	Denver, Colo.
Cotton Exchange Building Company.	Memphis, Tenn.
Thos. E. Hughes	Fresno, Cal.
Cone and Kimball Company.	Red Bluff, Cal.
E. F. Gould	Atlanta, Ga.
T. C. Naramore	Los Angeles, Cal.
Real Estate and Law Building Company.	Atlantic City, N. J.
James Wyer	Nantucket, Mass.
John L. Norris	Yankton, Dak.
Board of Trade	Columbus, Ohio.
O. P. Helm	Huron, Dak.
Chas. W. Button	Lynchburgh, Va.
New Haven Investment Co.	New Haven, Conn.
Walla Walla Lodge, No. 56, I. O. O. F.	North Platte, Nebr.
Board of Trade	Buffalo, N. Y.
Merchants' Bank	Moorhead, Minn.
H. Groesbeck, adm'r	Salt Lake City, Utah.
J. B. Grady	Eastport, Me.
Bolton & McRae	Alpena, Mich.
First National Bank	Portland, Me.
G. W. Schmidt	Pittsburgh, Pa
Lorenzo Littlefield	Block Island, R. I.
Porter, Reeves & Co.	Abilene, Tex.
Geo. W. Williams	Charleston, S. C.
American Exchange Bank.	Duluth, Minn.
Abbie S. Ingalls	Indianapolis, Ind.
Burton S. Williams	Concordia, Kans.
E. D. Franz	Santa Fé, N. Mex.
C. M. Beeson	Dodge City, Kans.
A. E. Rouiller	Lava, N. Mex.
Sedgwick Building Investment Co.	Wichita, Kans.
Geo. S. Waite	Key West, Fla.
J. R. Tendick	San Antonio, Tex.
D. W. Powers	Rochester, N. Y.
Staples & Pelan	Dubuque, Iowa.
J. R. Boyd	Leavenworth, Kans.
L. M. Sheldon	El Paso, Tex.
H. H. Buhne	Eureka, Cal.
The State Bank	Keokuk, Iowa.
Real Estate and Law Building Co.	Atlantic City, N. J.
J. T. Baum	Vicksburg, Miss.
H. W. Styron	Hatteras, N. C.
Board of county commissioners (Humboldt County).	Winnemucca, Nev.
F. E. Warren	Cheyenne, Wyo.
T. J. Allen	Valentine, Nebr.
C. B. Rogers	Cedar Keys, Fla.
S. Marks & Co	Roseburg, Oreg.
Cone & Kimball Co	Red Bluff, Cal.
Hale, Dingley & Co	Montgomery, Ala.
Henry Ash	Palestine, Tex.
Geo. H. C. Neal	Baltimore, Md.
Vanderbilt University	Nashville, Tenn.
Nathan Myrick	St. Vincent, Minn.
S. C. Ashby & Co	Helena, Mont.
First National Bank	Sault de Ste. Marie, Mich.
Thomas Sweeney	Rapid City, Dak.
Paine Brothers	Walla Walla, Wash.
Estate of Alex. Mitchell	Milwaukee, Wis.
The Board of Trade	Little Rock, Ark.
D. S. Hutchinson	Titusville, Fla.
W. H. Warren	Augusta, Ga.

METHODS OF BUSINESS.

It is proper that I make some allusion to the changes in the methods which have been suggested, and, with your approval, put in operation in this division during the year, by which it is believed the fiscal business of the office is disposed of with the greatest degree of correctness and promptness with the least expenditure of time and labor.

The use of letters-received books was discontinued, and, in lieu thereof, the card-index system, similar to the card-catalogue system in use in libraries, was adopted. The plan was to be put in operation only in this division, but it is believed that it could be generally adopted throughout the office with beneficial results, as in its nature it simply applies to the transactions of the Government the methods followed by business men, and is in conformity with the plan suggested by the Board on Business Methods in the War Department, which was approved by the honorable the Secretary of War.

The omission of the name of the payee of a voucher from the abstracts of purchases and expenditures (the number and amount of the voucher being considered a sufficient identification of the account), which was put in practice last year, was objected to by the accounting officers of the Treasury Department, and the plan not only had to be abandoned, but the omission had to be supplied on all abstracts.

On October 6, 1888, a plan was submitted and approved by the honorable the Secretary of War by which the number of rates for commutation of quarters, commutation of fuel, and commutation of rations was reduced from twelve to three, thus obviating much trouble and annoyance in calculating the various rates. By the plan uniform rates for commutation of fuel and for commutation of rations were established, the result of which was an equalization of the pay of the enlisted men of the Signal Corps on a basis of justice and equity so far as the amounts appropriated would allow.

In order to reduce the large number of small accounts, a plan was proposed on April 16, 1889, of having certain items, such as janitor, brooms, soap, fuel, gas, oil, matches, water, and ice, furnished by the landlord and included in the lease, for the fiscal year ending June 30, 1890. Out of 105 stations at which rent was paid about 68 acquiesced in the plan and agreed to furnish the items for a sum slightly exceeding (in some cases less) what had been heretofore paid for them. By this scheme the number of these accounts will be reduced from 2,700 per annum to 500 per annum, resulting in a considerable saving of time and labor.

Other changes in methods have been made from time to time during the year, but, as they were of a minor character, it is not considered necessary to mention them in this report.

RECOMMENDATIONS.

I desire to invite attention to a few suggestions having in view a more efficient and economical administration of the public business.

(1) The present rules in regard to bids require that they be submitted in duplicate; abstracts of proposals are also required to be made in duplicate, and in a large number of cases the cost of the clerical work required to prepare the papers equals, if it does not exceed, the cost of the article or service for which the advertisement was issued. besides involving delays of from ten to thirty days. If the approval of the War and Treasury Departments can be obtained, I would suggest that where the amount involved is $50 or less the mode of purchase or employment be left to the discretion of the disbursing officer, or the officer required to make the purchase or secure the service. In case the purchase is made or the service procured in open market, it must be at the lowest obtainable rates; the accounts to contain a certificate in effect that the prices charged are reasonable and as low as charged by regular dealers in the locality to private individuals.

(2) Referring to section 49 of the act of Congress entitled "An act to provide for the organization of the militia of the District of Columbia," approved March 1, 1889 (Public No. 93), it is recommended that steps be taken to have the section amended by the introduction of a proviso which will modify the compulsory feature and permit of some discretion on the part of heads of bureaus in granting leaves of absence. The portion of the section referred to reads: "All officers and employés of the United States shall be entitled to leave of absence," etc., and the operation of this, so far as this office is concerned, would necessitate the entire cessation of all public business in some of the divisions of this office. It would seem proper, therefore, in order to prevent such a contingency, that the language of the section be changed, and the following is suggested:

"SECTION 49. That all officers and employés of the United States and of the District of Columbia who are members of the National Guard shall be entitled, provided their services can be spared, to leave of absence from their respective duties, without loss of pay or time, on all days of any parade or encampment ordered or authorized under the provisions of this act."

(3) It is suggested that in submitting the estimates for the fiscal year ending June 30, 1891, that Congress be asked to consolidate the amounts of the several subappropriations under the general appropriation "Observation and report of storms," and appropriate one aggregate sum thereunder, in lieu of the present plan of making a dozen or more small specific appropriations. It is believed that under the plan suggested a much more efficient and economical service can be secured.

(4) It is recommended that action be taken to secure to enlisted men of the Signal Corps, when traveling, a fixed and definite rate for expenses, in lieu of subsistence, etc., and for that purpose I would suggest the following draft of a proposed proviso, to be inserted in the next appropriation for transportation:

"Enlisted men of the Signal Corps, when traveling under competent orders, changing stations, or inspecting special stations, and other detached duty in connection with the Signal Service, shall be entitled to transportation in kind, or, if no transportation be furnished, to a reimbursement of the cost thereof, actually paid by them for travel-fare by the usual conveyance, inclusive of transfer to and from railway stations, not exceeding 50 cents for each transfer, and of one berth in sleeping-cars, or on steamers (when an extra charge is made therefor). They will also be entitled to reimbursement for the actual cost of meals and rooms in hotels and eating-houses, not to exceed $3 per diem for each and every day unavoidably consumed in travel, or while on duty under the orders, including all absolutely necessary delays. The reimbursement or compensation under the orders shall be in lieu of any commutation of rations, commutation of quarters, and commutation of fuel to which the men would otherwise have been entitled during the period required in obeying the orders."

(5) Owing to the fact that Congress, in annexing certain provisos to the appropriations for this service for the fiscal year ending June 30, 1890, failed to expressly state its intentions, and in order to remove the complications which have presented themselves in construing the law, it is suggested that Cangress be asked, as its next session, to settle the matter by definite legislation, and the following draft of an act, which it is believed fully covers the case, is submitted:

AN ACT to regulate the disbursement of the appropriations made for the Signal Service, and the auditing of the accounts thereof.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That from and after the passage of this act all appropriations made for the support of the Signal Service or Corps shall be disbursed under the direction of the Secretary of War by the regularly bonded officer who is now or may be hereafter detailed by the Secretary of War for duty as disbursing officer of the Signal Service; that all accounts, of whatever nature, resulting from the disbursement of any of the appropriations made for the Signal Service or Corps, shall be audited and adjusted by the Third Auditor and the Second Comptroller of the Treasury, that the amounts which have heretofore been appropriated for the enlisted men of the Signal Corps under the heads of "Commutation of rations," "Commutation of quarters," and "Commutation of fuel," shall hereafter, together with the item of pay proper, constitute one fund, to be known as "Signal Service pay," and be so appropriated, disbursed, and accounted for; that any money deposited by any enlisted men of the Signal Corps, under the provisions of section 1305 of the Revised Statutes, shall pass to the credit of the appropriation "Signal Service pay," and when paid, including the interest thereon, shall be charged to that appropriation for the fiscal year in which the soldier is discharged; and all laws, acts, or parts of laws or acts, inconsistent herewith are, for these purposes only, modified accordingly.

(6) Since the abolishment of Fort Myer, Virginia, as a school of instruction for the enlisted men of the Signal Corps, no reason exists why the items of commutation of rations, commutation of quarters, and commutation of fuel should be appropriated for as such. These commutation allowances have always been considered, and as a matter of fact are, part of the salary or pay of the enlisted men of this Service, and it would seem eminently proper that the distinction, which is only a fiction, be done away with, and that a sum be fixed upon and known as "Signal Service pay," which sum shall not be less than the aggregate of the present rates for pay proper and those for the various commutations.

(7) At the time when this Bureau was first called upon to submit specific estimates for all items required by it there was attached to the Service the school of instruction at Fort Myer, Virginia, and it was necessary to provide for the expenses thereat (which expenses had formerly been borne by certain appropriations for the support of the Army) by estimating for them under the same general heads as were used in the Army; thus, the item of fuel was called "regular supplies," and so on. Now, however, there is no necessity for such distinction, and it is recommended that the item of fuel be estimated for under the general head "Observation and report of storms," where it legitimately belongs.

(8) It is recommended that steps be taken to secure the necessary legislation, so that in case of a vacancy occurring in any grade of clerk or copyist in the office of the Chief Signal Officer, at Washington, D. C., said vacancy may be filled by the transfer of any enlisted man of the Signal Corps who may have served not less than five years as such, provided the salary of such grade is no greater than the aggregate amount of the pay and allowances of such enlisted man at the time of the transfer, and such transfer shall entitle the said enlisted man to his discharge as a soldier, and he shall thereafter be considered as in the classified departmental service of the United States. This would be not only a proper recognition of the services of a faithful and deserving class of men, but it would enable the clerical force on duty in this office to be maintained at a proper standard of efficiency, by filling vacancies therein with men trained in meteorological science and familiar with the routine duties required of clerks in this office.

(9) The work of the copyists in this office is principally that of computing, and the ordinary examination, under the civil-service law for copyists, does not furnish the proper test of ability; it would seem desirable, therefore, to secure, if possible, a *special* examination to fill such positions, especially in cases where it would not be considered advisable to transfer, as recommended above, an enlisted man to such work.

(10) Although there are public buildings at Columbus, Ohio, Little Rock, Ark., Santa Fé, N. Mex., Baltimore, Md., Manchester, N. H., El Paso, Tex., and Dubuque, Iowa, this Service has been unable, through lack of room or other causes, to secure accommodations in said buildings, and it is therefore suggested that the Treasury Department be asked to make provision (in its estimates for any public building) for offices for use of the Signal Service, such offices to be not above the second floor in buildings having no elevators, and to be below the attic floor in those having elevators; provision should also be made for necessary approaches to the roof, board walks thereon, the erection of the instrument shelter and instruments, flagstaff for display of signals, and a proper outfit of furniture.

(11) The experience of the past winter in the occupancy of the building recently purchased for use of this office has demonstrated that it can not be properly heated by the boiler at present in use, which is small and its steam-generating capacity entirely inadequate to supply the needs; it is therefore recommended that a special estimate be submitted for an appropriation, to be immediately available, for the erection of another boiler of similar size alongside of the present one, and to ceil the woodwork above the boilers with asbestos sheathing; this, it is believed, will be more economical than to take out the present boiler and put in a larger one, as it will frequently happen that on mild days the small boiler will furnish sufficient heat.

(12) There is absolute need of more storage accommodations, and it is recommended that an appropriation be asked for the erection of a brick building, one story (12 feet) high, 116 feet long, and 9 feet wide, in the rear of the present main building, to take the place of the frail wooden structures which were temporarily erected at the time this office took possession of the premises; the water closets in the yard should also be extended so as to join on the store-house.

(13) The water supply is inadequate to keep the toilet rooms in the main building in proper sanitary condition, and steps should be taken to have new and larger mains and service pipes laid.

(14) In order to protect the buildings and for the economical handling of stores, etc., it will be necessary to take some action to put the approaches to the buildings and the walks and roadways around them in proper condition, and it is suggested that a concrete walk be laid around the building, and from the entrance of the main building towards M street, and completed with proper steps over the terrace; that the roadways around the building, also the area of annex, be paved with asphalt blocks, except on inclines, where Belgian blocks will be required.

(15) Under section 3646 of the Revised Statutes, as amended by the act of February 16, 1885, whenever any original check is lost, stolen or destroyed, disbursing officers and agents of the United States are authorized, after the expiration of *six months*, and within three years from the date of such check, to issue a duplicate. Now, as the Treasurer, assistant treasurers, and designated depositaries of the United States are directed to pay such duplicate checks *only* upon notice and *proof* of the loss of the original checks, and upon the execution of such *bonds*, with *sureties*, to indemnify the United States in case of loss by duplicate payment, it seems that the interests of the Government are thereby fully protected and a duplicate check ought to issue *at once* upon filing *proof* of loss and the proper bonds, instead of being delayed for the period of six months, which delay works considerable hardship in the cases of payees of checks (of small amounts) covering their salaries.

STATUS OF WORK.

Notwithstanding the large increase of work caused by the transfer to this division of the disbursement of the appropriations for transportation, for the various commutations of the enlisted men, and for the medical department, the work of the division is up to date, and, with a less number of clerks, is more promptly and accurately performed than at any previous time, and I most cheerfully commend the clerks and other employés of the division for the faithful and efficient manner in which they have performed the duties assigned to them.

Very respectfully,

ROBERT CRAIG,
Captain and A. Q. M., U. S. A., Disbursing Officer, Signal Service.

The CHIEF SIGNAL OFFICER.

APPENDIX 8.

ANNUAL REPORT OF THE CORRESPONDENCE DIVISION, 1888–'89.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, July 1, 1889.

SIR: I have the honor to submit the annual report, in duplicate, of the correspondence division for the year ending June 30, 1889. The work of the division falls naturally under the following heads:

"LETTERS RECEIVED" AND "LETTERS SENT."

The "letters received" (and this title includes telegrams, etc.), relating to the work of the correspondence, stations and telegraph divisions, and of other divisions having no special files of their own (including the correspondence of the records division with observers on station), are recorded in and distributed for action from this division. Since January 1, 1888, only the "signal" series (important) letters have been briefed, recorded, indexed, etc.; the others, "miscellaneous" and "observers," after receiving a date-stamp and number, being simply listed and filed, with reference to name of writer or station of observer, respectively, and consequently the work of briefing, and recording, or listing the several series (except the "enlistment") is now accomplished by one clerk. The saving of clerical labor this implies will be understood when it is stated that a few years ago (1882–'83) there were at one time seven clerks engaged in this division in briefing, recording, and indexing "letters received." (The number of "letters received" in the correspondence division in 1882 was 19,870; in the year just closed, 14,597.) Some of the classes of letters then recorded in the correspondence division are now sent, unentered, to the publications and records divisions, where they are merely listed and filed alphabetically, consuming not half the time of one clerk for both divisions. The number of letters now entered (and briefed when necessary) by one clerk in the correspondence division would have taken the time of four clerks under the old system, because not only important papers, but those on the simplest matters (including requests for leave of absence, and similar papers, which are now made on printed blanks) were then briefed, recorded, etc., with the most careful but profitless and expensive elaboration. The present method not only accomplishes a saving in clerical labor, but results in letters reaching those by whom action is to be taken early on the morning of date of receipt, so that replies, etc., can be made on the same day. Formerly, on account of the delay in recording, etc., many of the letters did not reach those for whom intended until the afternoon of the day of receipt, thus precluding action on that date. The present simple, inexpensive, and expeditious method does not, however, provide as complete a record for *unimportant* letters as the old one, but it has worked satisfactorily so far, and is believed to be sufficient.

The plan of using card records in lieu of "letters received" books, recently promulgated by the War Department, it is recommended be not substituted for the present system in this division until the test of the cards, which one of the other divisions of this office is soon to commence using, shall have demonstrated their superiority in the direction of clerical economy and expedition of business. The adoption of the card system for the "miscellaneous" and "observers" letters would necessitate the assignment of at least one additional clerk for that work. It could be adopted at once for the "signal" series without increase of force, but January 1, 1890 (the date when new series all commence), would be the most desirable time to make such a change, especially as some months' experience with the cards in the other division will then be available.

"Letters sent" are press-copied in books designated (to correspond with "letters received"), "signal," "miscellaneous," "observer's," "mustering officer's," "enlistment and discharge," and "instruments"; the two latter not requiring the indexing of subject-matter, as the titles indicate it. This work it is believed is done as expeditiously and economically as it is possible to do it.

The number of "letters received" (with the "enlistment" series) entered in the books of this division during the year was 15,567; number of "letters sent" press-copied, dispatched, and indexed, 34,035.

File-room.—In the latter part of 1888 a file-room was established as a central depository for all the "letters received" in the Bureau since its organization. With the exception of a few special files (war records, etc.) which have been kept apart for a purpose, all the letters—nearly 700,000—which were recently filed in the several divisions to which they pertained, have been collected in this room and arranged in order, for ready reference. The clerk in charge is now engaged in verifying the several series and making explanatory notes as to the papers not in their places in the file. The charge of this room was transferred from the disbursing to the correspondence division on May 20, 1889.

GENERAL AND SPECIAL ORDERS, CIRCULARS, INSTRUCTIONS, AND MEMORANDUMS.

Since March, 1888, the necessary number of copies of instructions, and, with a few exceptions, of special orders, has been prepared in this division by the mimeograph process, thus not only relieving the publications division from the work of printing them, as formerly, but avoiding the delay incident to proof-reading and revising the printed matter.

Following is a statement of the number of orders, etc., prepared and distributed during the year:

General orders and circulars (printed) 53; copies and extracts distributed	21,510
Special orders (mimeographed) 144; copies distributed	5,610
Instructions (mimeographed) 57; copies distributed	2,200
Memorandums (mimeographed) 145; copies distributed	520
Transportation requests secured to accompany orders enjoining journeys	1,102

EXAMINATION OF RECRUITS, ENLISTMENTS, DISCHARGES, ROLLS, PAY ACCOUNTS.

During the year 62 candidates for enlistment were subjected to written examination in six subjects each; 33 men were enlisted, 61 re-enlisted, and 202 discharged, including 1 who was retired, 1 who was killed, and 1 who died. The employés of this office (101) whose status was changed from enlisted to civilian by the act approved October 2, 1888, as well as the 61 men who re-enlisted, are also included in the number given as discharged. The number of enlisted men in the corps on June 30, 1889, was 315, being 5 less than the number authorized by law. The War Department approval, dated June 13, 1889, of the Chief Signal Officer's recommendation that he execute and mail discharge certificates, in all cases, to enlisted men of the Signal Corps, instead of requiring them to go through the formality of reporting to a commissioned officer to receive the discharge certificate, provides a more direct and speedy course, and will effect a saving in clerical labor.

VOUCHERS FOR ENLISTED MEN'S COMMUTATION, AND ROLLS FOR PAY PROPER.

The duties of the mustering officer were transferred on July 1, 1888, from the disbursing division to this division. The work of preparing the vouchers is now so systemized as to be performed with the least expenditure of clerical labor. It does not now consume the whole time of one clerk, while there were three clerks engaged on the work a year ago. The preparation of rolls for pay proper (in addition to the commutation vouchers), will hereafter be unnecessary, in view of the recent act of Congress providing that all the pay and allowances of enlisted men of the Signal Corps shall be paid by one check. Heretofore pay proper was paid by check of an Army paymaster, and allowances by a check of the disbursing officer of the Signal Service, thus requiring double sets of vouchers and the issue of two checks. Besides the additional clerical labor that practice involved, it had the disadvantage of paying the men their monthly compensation in two installments, as the disbursing officer's check was usually mailed on the last day of each month and the paymaster's about eight days after.

During the year there were prepared in this division:

Rolls or returns (sheets)	824
Vouchers	6,464
Enlistment papers	282
Discharge certificates	199
Final statements	303

EMPLOYÉS, RECORD OF QUALIFICATIONS AND OF ABSENCE, ETC.

Card records or official histories of the enlisted men of the Signal Corps have been kept up during the year by the entry of notes as to any unusual conduct, etc., etc., of the men. Somewhat similar cards, giving the personal history of, in so far as it relates to their official positions, of the civilian employés in this office, and showing their qualifications, etc., have been prepared and are convenient for ready reference.

Clerks' daily report of work—In the last annual report of this division attention was invited to the profitless consumption of time of clerks in making the daily report of work prescribed by War Department circular of April 23, 1887. On December 17, 1888, the Chief Signal Officer, in a letter to the Secretary of War, again reported the facts in the case, stating that the equivalent of the whole time of three or four clerks was thus consumed, daily, and recommending the discontinuance of these reports. They were ordered discontinued by War Department circular of January 21, 1889.

Absence.—Following is a statement of the total and average absence of employés during the fiscal year:

Employés.	Average number.	Total absence—days.		Average absence—days.	
		With leave.	On account of sickness.	With leave.	On account of sickness.
Male	160	3,922	720½	24.5	4.5
Female	18¾	477½	205½	25.5	11.0

A total absence of 351 days, without pay, by civilian employés (90½ days by male, and 261 days by female employés), and a total absence of 107 days by two enlisted clerks (sick) on furlough pay, paid to October 1, 1888, is not included in the above.

WAR RECORDS.

This branch of the work is placed last, not as being the one of least importance, but as less of a current character than the others. Up to within a few years the books, letters, rolls, returns, reports, and miscellaneous papers in this office relating to the war period were poorly arranged and but few indexed. Consequently, when a call was made for all the facts of record in the case of an applicant for pension, it took several days for a clerk familiar with the papers to secure the desired information. To prevent this delay, in the year preceding the one just closed a "name" index was completed of the books and letters, but there still remained unindexed a very large number (nearly 9,000) of miscellaneous papers, including rolls, returns, etc., on some of which there were hundreds of names. By using the clerical force set free through the discontinuance of profitless work in other directions in the division, each of these returns, etc., was given a number, and all the names thereon were indexed during the past year; so that there is now available an index pointing to every paper or book in this office, in which each man's name appears. As this index, owing to the fact that several clerks were engaged at the same time on the work, is composed of twenty-four books, the advisability was considered of making a card index, giving to each man a separate card on which would appear the numbers of every paper, etc., in which his name occurred. The Chief-Signal Officer decided, however, to commence, instead, the preparation of a military (war) history, in so far as it is of record in this office, of each man. Accordingly a blank, carefully prepared in tabular form to suit the general requirements of most cases, was printed, and three clerks were at once put at the work, which will be pushed to completion. It will probably be finished, or nearly so, at the end of the current year. Then the history, as set forth in these records, of any man who served in or with the Signal Corps during the war can be furnished immediately upon receipt of application therefor. Even under the existing circumstances, ever since the present Chief-Signal Officer gave directions, in 1887, that official requests for information as to claimants for pension should be made special and given precedence over other work, these calls for information have, with rare exceptions, been answered within twenty-four hours of date of receipt, and in some cases on the same day. From January, 1882, to June 30, 1888, 383 calls were received and reported on; 83 were received and reported on during the fiscal year just closed; in all 466 cases since 1882.

OFFICERS AND CLERKS IN THE DIVISION, CHANGES IN.

Capts. James Allen and Robert Craig, First Lieut. Richard E. Thompson, and Second Lieuts. Frank Greene, John P. Finley, James Mitchell, and Frank W. Ellis were in charge of the division at different periods from July 1, 1888, to May 31, 1889. Since that date no officer has been in charge of the division, the Chief Signal Officer, in order to bring the organization of the office into conformity with that of the other bureaus of the War Department, having discontinued the assignment of an officer as adjutant (the title of the officer who had charge of the correspondence division).

Mr. Otto A. Nesmith was appointed on October 9, 1888, to the chief clerkship of this bureau, a position first provided for by the Act of Congress approved October 2, 1888; and the undersigned, who had up to that time performed the duties of chief clerk, was appointed chief clerk of the correspondence division.

During the year there was an actual reduction of one clerk (by resignation of Mrs. C. T. Emory, Class 1, whose place in this division was not filled), but there was an increase of three clerks—stenographer, file-clerk, and one mustering clerk—who were transferred, with their duties, to this division. In addition, two copyists, engaged on war records, were assigned for ten days in June, 1889. Clerks, June 30, 1888, 11; June 30, 1889, 13.

Inclosed are the lists, in duplicate, usually furnished by the correspondence division, as follows:

Stations inspected during the year.

Places at which the establishment of stations was requested during the year, but at which stations were not established.

Meteorological committees of boards of trade, etc., which were in communication with the Chief Signal Officer during the year.

Following is the number of communications sent from and received in all divisions of this office during the year:

Communications received, including inclosures and meteorological forms, etc.	293,674
Communications sent, including orders, etc., distributed	94,592
Bulletins, weather maps, annual reports, and other publications distributed from Washington	252,487
Total	640,753

Telegrams:	
Cipher words of reports sent and received, about	1,000,000
Telegrams, other than weather reports, sent and received, about	72,500

Very respectfully,

J. B. McLAUGHLIN,
Chief of the Correspondence Division.

The CHIEF CLERK, SIGNAL OFFICE,
War Department.

List of boards of trade, chambers of commerce, and other organizations which had, during the fiscal year ending June 30, 1889, *meteorological committees conferring with the Chief Signal Officer of the Army.*

Place.	Name of organization.	Committee.
Block Island, R. I		B. B. Mitchell, Ray S. Littlefield, Charles E. Perry.
Boston, Mass	Society of Arts	Prof. William H. Niles, J. A. Dresser, G. L. Roberts.
Buffalo, N. Y	Merchants' Exchange	Nathan C. Simons, Frank W. Fiske, Charles H. Arthur.
Charleston, S. C	Chamber of Commerce	P. Gourdin De Saussure, J. L. Sheppard, S. V. Stewart.
Do	Merchants' Exchange	George W. Bell, T. Follett Ware, John Dougherty, Philip Dressel, George Von Kolnitz.
Charlotte, N. C	Chamber of Commerce	T. F. Drayton, S. A. Cohen, W. W. Fleming.
Chattanooga, Tenn	do	Dr. J. W. Bachman, J. B. Nicklin, Hugh Whiteside, D. B. Loveman, J. F. Loomis.
Chicago, Ill	Board of Trade	R. G. Chandler, Z. P. Brosseau, Adolph Seckel.
Concordia, Kans		B. H. McEkron, Theodore Laing, Prof. T. A. Sawhill.
Duluth, Minn	do	W. Van Brunt, Ward Ames, O. C. Hartman.
Erie, Pa	do	J. J. Wadsworth, H. S. Jones, George Platt.
Grand Haven, Mich		Hon. Dwight Cutler, T. W. Kirby, G. W. A. Smith.
Huron, Dak	Board of Trade	John Cain, Augustine Dovis, Hon. George W. Sterling.
Louisville, Ky	Polytechnic Society	E. A. Grant, James L. Howe, Laf Joseph, E. H. Mark.
Montgomery, Ala	Cotton Exchange	John W. Durr, J. D. Beals, F. M. Fisk.
North Platte, Nebr		T. F. Hantt, T. J. Foley, T. C. Patterson, W. B. Risse, I. A. Fort.
Pittsburgh, Pa	Grain and Flour Exchange	T. L. Rogers, D. G. Stewart, R. S. McCague.
Portland, Oreg	Chamber of Commerce and Board of Trade.	Rev. Dr. George H. Atkinson, E. H. Page, George H. Himes.
Rapid City, Dak	Board of Trade	G. E. Bailey, V. T. McGillicuddy, J. R. Brennan, O. L. Cooper, P. B. McCarty.
Sacramento, Cal	do	P. E. Platte, E. J. Gregory, E. R. Hamilton, William Geary, Thomas B. Hall.
San Diego, Cal	Society of Natural History	Dr. G. W. Barnes, Dr. H. W. Gould, C. J. Fox.
San Francisco, Cal	Chamber of Commerce	William M. Merry, W. W. Dodge, Jacob Faber.
Salt Lake City, Utah	do	C. F. Annett, George Arbogast, W. A. Neldon.
Springfield, Ill	City	Frank Fleury, Prof. J. H. Collins, H. W. Clendenin, George S. Connolly, William Ridgeley, R. B. Hoover, John M. Garland, G. S. Dana.

Stations inspected during fiscal year ending June 30, 1889.

Stations.	By whom.	Date.
Ashland, Oregon	Lieut. J. E. Maxfield, Signal Corps	September 7, 8, 1888.
Astoria, Oregon	do	September 2, 3, 1888.
Alpena, Mich	Lieut. Robert Craig, acting signal officer.	October 12–15, 1888.
Do	Lieut. F. R. Day, Signal Corps	April 18, 19, 1889.
Albany, N. Y	Lieut. B. M. Purssell, Signal Corps	July 10, 11, 1888.
Do	Lieut. W. D. Wright, Signal Corps	January 17–19, 1889.
Assinniboine, Fort, Mont	Lieut. B. M. Purssell, Signal Corps	October 29, 30, 1888.
Do	Lieut. F. R. Day, Signal Corps	May 10, 1889.
Atlantic City, N. J	Lieut. F. Greene, Signal Corps	February 16, 17, 1889.
Augusta, Ga	do	April 9, 1889.
Abilene, Tex	Lieut. F. W. Ellis, Signal Corps	May 9, 1889.
Apache, Fort, Ariz	Lieut. W. A. Glassford, Signal Corps	June 29, 1889.
Atlanta, Ga	Lieut. F. R. Day, Signal Corps	February 2, 1889.
Baltimore, Md	Lieut. J. Mitchell, Signal Corps	October —, 1888.
Bismarck, Dak	do	May 3–7, 1889.
Brooks, Utah	do	August 27, 1888.
Boise City, Idaho	Lieut. J. E Maxfield, Signal Corps	August 7–9, 1888.
Do	Lieut. F. R. Day, Signal Corps	May 23, 1889.
Buford, Fort, Dak	Lieut. B. M. Purssell, Signal Corps	October 21, November 1, 1888.
Do	Lieut. F. R. Day, Signal Corps	May 9, 1889.
Brownsville, Tex	Lieut. F. W. Ellis, Signal Corps	January 8–10, 1889.
Bowie, Fort, Ariz	Lieut. W. A. Glassford, Signal Corps	June 20, 1889.
Boston, Mass	Lieut. W. D. Wright, Signal Corps	December 4–6, 1888; January 4–6, 1889.
Cheyenne, Wyo	Lieut. F. R. Day, Signal Corps	August 8, 9, 1888.
Do	do	May 30, 1889.
Carson City, Nev	Lieut. J. E. Maxfield, Signal Corps	July 29, 30, 1888.
Canby, Fort, Wash	do	September 1, 2, 1888.
Cairo, Ill	Lieut. J. C. Walshe, Signal Corps	October 22, 23, 1888.
Do	Lieut. R. B. Watkins, Signal Corps	March 28, 29, 1889.
Cincinnati, Ohio	Lieut. Robert Craig, acting signal officer.	November 8–12, 1888.
Do	Lieut. F. R. Day, Signal Corps	June 18, 19, 1889.
Custer, Fort, Mont	Lieut. B. M. Purssell, Signal Corps	October 19, 20, 1888.
Do	Lieut. F. R. Day, Signal Corps	May 13, 14, 1889.
Concordia, Kans	Lieut. R. B. Watkins, Signal Corps	October 17, 18, 1888.
Do	do	April 19, 1889.
Chattanooga, Tenn	Lieut. J. C. Walshe, Signal Corps	October 27, 28, 1888.
Cleveland, Ohio	Lieut. F. R. Day, Signal Corps	April 7, 8, 1889.
Colorado Springs, Colo	Lieut. R. B. Watkins, Signal Corps	April 10, 1889.
Crete, Nebr	do	April 26, 1889.
Cape Henry, Va	Lieut. F. Greene, Signal Corps	March 11, 1889.
Charleston, S. C	do	March 26, 1889.
Cedar Keys, Fla	do	April 6, 7, 1889.
Columbia, S. C	do	April 10, 1889.
Charlotte, N. C	do	April 11, 1889.
Corpus Christi, Tex	Lieut. F. W. Ellis, Signal Corps	June 12–15, 1889.
Chicago, Ill	Lieut. F. R. Day, Signal Corps	June 13, 14, 1889.
Columbus, Ohio	do	June 20, 21, 1889.
Denver, Colo	do	August 16–21, 1888.
Do	Lieut. R. B. Watkins, Signal Corps	April 13, 1889.
Du Chesne, Fort, Utah	Lieut. F. R. Day, Signal Corps	August 28, 1888.
Duluth, Minn	Lieut. Robert Craig, acting signal officer.	October 23–26, 1888.
Do	Lieut. F. R. Day, Signal Corps	April 30, 1889.
Davenport, Iowa	Lieut. Robert Craig, acting signal officer.	November 1, 1888.
Do	Lieut. R. B. Watkins, Signal Corps	May 1, 1889.
Des Moines, Iowa	do	November 6–8, 1888.
Do	do	April 29, 1889.
Detroit, Mich	Lieut. F. R. Day, Signal Corps	April 10, 1889.
Dubuque, Iowa	do	June 11, 1889.
Eastport, Me	Lieut. W. D. Wright, Signal Corps	January 9, 10, 1889.
Erie, Pa	Lieut. F. R. Day, Signal Corps	April 6, 1889.
Elliott, Fort, Tex	Lieut. F. W. Ellis, Signal Corps	May 3, 1889.
Fort Smith, Ark	do	April 19, 20, 1889.
Green Bay, Wis	Lieut. Robert Craig, acting signal officer.	October 18–20, 1888.
Do	Lieut. F. R. Day, Signal Corps	April 24, 1889.
Grand Haven, Mich	do	April 18, 1889.
Galveston, Tex	Lieut. F. W. Ellis, Signal Corps	June 14, 15, 1889.
Grant, Fort, Ariz	Lieut. W. A. Glassford, Signal Corps	June 22, 1889.
Helena, Mont	Lieut. B. M. Purssell, Signal Corps	October 27, 28, 1888.
Do	Lieut. F. R. Day, Signal Corps	May 12, 1889.
Harrisburgh, Pa	Lieut. F. Greene, Signal Corps	February 12, 13, 1889.
Do	Lieut. Robert Craig, acting signal officer.	October 3, 4, 1888.
Huron, Dak	Lieut. F. R. Day, Signal Corps	June 7, 8, 1889.
Hatteras, N. C	Lieut. F. Greene, Signal Corps	March 18, 1889.
Indianapolis, Ind	Lieut. J. C. Walshe, Signal Corps	October 20, 21, 1888.
Do	Lieut. F. R. Day, Signal Corps	June 15, 1889.
Jacksonville, Fla	Lieut. F. Greene, Signal Corps	March 28, 29, 1889.
Jupiter, Fla	do	April 2, 1889.

Stations inspected during fiscal year ending June 30, 1889—Continued.

Stations.	By whom.	Date.
Kansas City, Mo	Lieut. R. B. Watkins, Signal Corps	April 23, 1889.
Do	Lieut. F. R. Day, Signal Corps	August 3, 4, 1888.
Keokuk, Iowa	Lieut. R. B. Watkins, Signal Corps	November 9–12, 1888.
Do	do	May 2, 3, 1889.
Knoxville, Tenn	Lieut. J. C. Walshe, Signal Corps	October 29, 30, 1888.
Kitty Hawk, N. C	Lieut. F. Greene, Signal Corps	March 14, 1889.
Laramie, Fort, Wyo	Lieut. F. R. Day, Signal Corps	August 7, 8, 1888.
Do	do	May 31, 1889.
Lynchburgh, Va	Lieut. Robert Craig, acting signal officer.	November 14, 15, 1888.
Do	Lieut. F. Greene, Signal Corps	April 13, 1889.
Lansing, Mich	Lieut. F. R Day, Signal Corps	Apri 12, 1889.
La Crosse, Wis	do	April 25, 26, 1889.
Leavenworth, Kans	Lieut. R. B. Watkins, Signal Corps	April 24, 1889.
Do	do	October 13, 15, 1888.
Lamar, Mo	do	October 8, 9, 1888.
Little Rock, Ark	Lieut. F. W. Ellis, Signal Corps	April 18, 1889.
Louisville, Ky	Lieut. F. R. Day, Signal Corps	June 16, 17, 1889.
Lava, N. M	Lieut. W. A. Glassford, Signal Corps	June 18, 1889.
Manistee, Mich	Lieut. Robert Craig, acting signal officer.	October 10, 11, 1888.
Do	Lieut. F. R. Day, Signal Corps	April 14, 15, 1889.
Marquette, Mich	Lieut. Robert Craig, acting signal officer.	October 21–23, 1888.
Do	Lieut. F. R. Day, Signal Corps	April 22, 23, 1889.
Maginnis, Fort, Mont	Lieut. B. M. Purssell, Signal Corps	October 23, 24, 1888.
Do	Lieut. F. R. Day, Signal Corps	May 16, 17, 1889.
Memphis, Tenn	Lieut. J. C. Walshe, Signal Corps	October 24, 25, 1888.
Do	Lieut. F. W. Ellis, Signal Corps	April 17, 1889.
Manchester, N. H	Lieut. W. D. Wright, Signal Corps	November 28, 29, 1888.
Montgomery, Ala	Lieut. F. R. Day, Signal Corps	February 1, 1889.
Moorhead, Minn	do	May 1, 1889.
Micco, Fla	Lieut. F. Greene, Signal Corps	April 1, 1889.
Milwaukee, Wis	Lieut. F. R. Day, Signal Corps	June 12, 13, 1889.
Montrose, Colo	Lieut. W. A. Glassford, Signal Corps	June 4, 5, 1889.
Mobile, Ala	Lieut. F. R. Day, Signal Corps	January 29, 30, 1889.
Neah Bay, Wash	Lieut. J. E. Maxfield, Signal Corps	August 23, 1888.
North Platte, Nebr	Lieut. R. B. Watkins, Signal Corps	October 20–22, 1888.
Do	do	April 15, 16, 1889.
Nashville, Tenn	Lieut. J. C. Walshe, Signal Corps	October 26, 27, 1888.
Northfield, Vt	Lieut. W. D. Wright, Signal Corps	January 14–16, 1889.
New Haven, Conn	do	January 22, 23, 1889.
New London, Conn	do	January 24, 25, 1889.
Nantucket, Mass	do	January 29, 30, 1889.
New Orleans, La	Lieut. F. R. Day, Signal Corps	January 27, 29, 1889.
New York City, N. Y	Lieut. F. Creene, Signal Corps	February 14, 15, 1889.
Norfolk, Va	do	March 11–13, 1889.
Olympia, Wash	Lieut. J. E. Maxfield, Signal Corps	August 30, 1888.
Oswego, N. Y	Lieut. B. M. Purssell, Signal Corps	July 8, 10, 1888.
Omaha, Nebr	Lieut. R. B. Watkins, Signal Corps	November 3–5, 1888.
Do	do	April 27, 1889.
Prescott, Ariz	Lieut. F. R. Day, Signal Corps	September 15–21, 1888.
Portland, Oregon	Lieut. J. E. Maxfield, Signal Corps	September 4, 5, 1888.
Pysht, Wash	do	August 24, 1888.
Port Angeles, Wash	do	August 25–28, 1888.
Poplar River, Mont	Lieut. B. M. Purssell, Signal Corps	October 30, 31, 1888.
Portland, Me	Lieut. W. D. Wright, Signal Corps	November 30, December 2, 1888.
Pensacola, Fla	Lieut. F. R. Day, Signal Corps	January 30, 31, 1889.
Pittsburgh, Pa	do	April 4, 5, 1889.
Port Huron, Mich	do	April 11, 1889.
Pueblo, Colo	Lieut. R. B. Watkins, Signal Corps	April 8, 1889.
Philadelphia, Pa	Lieut. F. Greene, Signal Corps	February 18, 19, 1889.
Palestine, Texas	Lieut. F. W. Ellis, Signal Corps	April 10, 11, 1889.
Robinson, Fort, Nebr	Lieut. F. R. Day, Signal Corps	August 6, 1888.
Rawlins, Wyo	do	August 14, 1888.
Do	do	May 29, 1889.
Red Bluff, Cal	Lieut. J. E. Maxfield, Signal Corps	September 10, 1888.
Roseburg, Oregon	do	September 6, 7, 1888.
Rochester, N. Y	Lieut. B. M. Purssell, Signal Corps	July 6–8, 1888.
Rapid City, Dak	do	October 12, 13, 1888.
Do	Lieut. F. R. Day, Signal Corps	June 2, 1889.
Raleigh, N. C	Lieut. F. Greene, Signal Corps	April 12, 1889.
Reno, Fort, Ind. Ter	Lieut. F. W. Ellis, Signal Corps	April 28, 29, 1889.
Rio Grande City, Texas	do	June 7, 8, 1889.
San Diego, Cal	Lieut. W. A. Glassford, Signal Corps	July 2, 1888.
Salt Lake City, Utah	Lieut. J. E. Maxfield, Signal Corps	August 3–5, 1888.
Spokane Falls, Wash	do	August 14, 15, 1888.
San Francisco, Cal	do	September 14–18, 1888.
Sacramento, Cal	do	September 11–13, 1888.
Sandusky, Ohio	Lieut. Robert Craig, acting signal officer.	October 6, 7, 1888.
Do	Lieut. F. R. Day, Signal Corps	April 8, 1889.

Stations inspected during fiscal year ending June 30, 1889—Continued.

Stations.	By whom.	Date.
Sault de Ste. Marie, Mich	Lieut. Robert Craig, acting signal officer.	October [illegible], 1888.
Do	Lieut. F. R. Day, Signal Corps	[illegible], 1889.
St. Paul, Minn	Lieut. Robert Craig, acting signal officer.	October [illegible], 1888.
Do	Lieut. F. R. Day, Signal Corps	April [illegible], 1889.
St. Louis, Mo	Lieut. Robert Craig, acting signal officer	November [illegible], 1888.
Springfield, Mo	Lieut. [illegible], Signal Corps	October [illegible], 1888.
Do	do	[illegible], 1889.
Springfield, Ill	do	November [illegible], 1888.
Do	do	May [illegible], 1889.
San Antonio, Tex	Lieut. F. R. Day, Signal Corps	February [illegible], 1889.
St. Vincent, Minn	do	May [illegible], 1889.
Spokane Falls, Wash	do	May [illegible], 1889.
Southport, N. C	Lieut. F. Greene, Signal Corps	March [illegible], 1889.
Savannah, Ga	do	March [illegible], 1889.
Shreveport, La	Lieut. [illegible], Signal Corps	April [illegible], 1889.
Supply, Fort, Ind. T	Lieut. [illegible], Signal Corps	May [illegible], 1889.
Sill, Fort, Ind. T	do	May [illegible], 1889.
Sully, Fort, Dak	Lieut. F. R. Day, Signal Corps	June [illegible], 1889.
Santa Fe, N. Mex	Lieut. W. A. Glassford, Signal Corps	June [illegible], 1889.
Stanton, Fort, N. Mex	do	June [illegible], 1889.
San Carlos, Ariz	do	June [illegible], 1889.
Tatoosh Island, Wash	Lieut. J. E. Maxfield, Signal Corps	August [illegible], 1888.
Toledo, Ohio	Lieut. Robert Craig, acting signal officer.	[illegible], 1888.
Do	Lieut. F. R. Day, Signal Corps	April [illegible], 1889.
Topeka, Kans	Lieut. [illegible], Signal Corps	[illegible], 1889.
Titusville, Fla	Lieut. F. Greene, Signal Corps	March [illegible], 1889.
Thomas, Fort, Ariz	Lieut. W. A. Glassford, Signal Corps	[illegible], 1889.
University, Miss	Lieut. [illegible], Signal Corps	April [illegible], 1889.
Vineyard Haven, Mass	Lieut. [illegible], Signal Corps	[illegible] February [illegible], 1889.
Vicksburg, Miss	Lieut. [illegible], Signal Corps	April [illegible], 1889.
Valentine, Nebr	Lieut. F. R. Day, Signal Corps	June [illegible], 1889.
Walla Walla, Wash	Lieut. J. E. Maxfield, Signal Corps	[illegible], 1888.
Do	Lieut. F. R. Day, Signal Corps	May [illegible], 1889.
Washakie, Fort, Wyo	do	August [illegible], 1888.
Do	do	[illegible], 1889.
Winnemucca, Nev	Lieut. J. E. Maxfield, Signal Corps	[illegible], 1888.
Wichita, Kans	Lieut. [illegible], Signal Corps	October [illegible], 1888.
Do	do	April [illegible], 1889.
Wilmington, N. C	Lieut. F. Greene, Signal Corps	March [illegible], 1889.
Willcox, Ariz	Lieut. W. A. Glassford, Signal Corps	June [illegible], 1889.
Yuma, Ariz	do	[illegible], 1889.
Yates, Fort, Dak	Lieut. F. R. Day, Signal Corps	May [illegible], 1889.
Yankton, Dak	do	June [illegible], 1889.

List of places for which stations have been established during fiscal year ending June 30, 1889.

Arizona:
Phoenix, April 1, 1889.
California:
[illegible], November 1, 1888.
Colorado:
Palmer Lake, January [illegible], 1889.
Georgia:
Augusta, Georgia, March [illegible], 1889.
Kansas:
Arkansas City, April [illegible], 1889.
Topeka, February [illegible], 1889.
Missouri:
[illegible], [illegible], 1889.
[illegible], [illegible], 1889.
St. Joseph, February [illegible], 1889.
New Jersey:
Asbury Park, August [illegible], 1888.
Toms River, April 1, 1889.
New York:
[illegible] Mountain [illegible], July [illegible], 1888.
Oregon:
[illegible], August [illegible], 1888.
[illegible], February [illegible], 1889.
Pennsylvania:
[illegible], July 1, 1888.
Texas:
[illegible], March [illegible], 1889.
[illegible], [illegible], 1889.
[illegible], [illegible], 1889.
Virginia:
[illegible], [illegible], 1889.
[illegible], [illegible], 1889.
Washington Territory:
Seattle, February [illegible], 1889.

APPENDIX 9.

REPORT OF THE OFFICER IN CHARGE OF THE STATIONS DIVISION.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, June 30, 1889.

SIR: I have the honor to submit the following report of the stations divisions for the year ending this day:

Stations have been established and discontinued as follows:

Station.	Date.
Second order.	
Opened:	
Manistee, Mich	July 1
Harrisburg, Pa	Do.
Wichita, Kans	Do.
Kansas City, Mo	Do.
Parkersburgh, W. Va	Do.
Closed:	
Fort Bridger, Wyo	Sept. 15
Fort Bidwell, Cal *	Oct. 13
Fort Davis, Tex	Dec. 31
Lamar, Mo	Do.
Columbia, S. C	Jan. 1
Topeka, Kans	Do.
Crete, Nebr	Do.
Fort Totten, Dak †	Jan. 15
Tatoosh Island, Wash †	Mar. 22
Poplar River, Mont	Mar. 31
Pike's Peak, Colo	Apr. 18
Fort Maginnis, Mont	June 30
To be opened, 1889:	
Meridian, Miss	July 1
Baker City, Oregon	Do.
Sioux City, Iowa	Do.
Mount Killington, Vt	Do.
Green Mountain, Me	Do.
Third order.	
Opened:	
Micco, Fla †	Aug. 31
Point Reyes Light, Cal ‡	Oct. 3
Columbia, S. C	Jan. 1
Crete, Nebr	Do.
Topeka, Kans	Do.
Tatoosh Island, Wash †	Mar. 22
	1889.
Taylor's Ranch, Utah—to date	July 1
Fort Maginnis, Mont—to date	Do.
Closed:	
Fort Stevens, Oregon §	July 31
Sebastian, Fla †	Aug. 31
Lakeview, Oregon *	Oct. 13
Fort Robinson, Nebr	Oct. 15
Terre Haute, Ind	Apr. 30
Fort Laramie, Wyo †	May 18
Brock's Ranch, Utah	June 30
Repair stations.	
Opened:	
Bly, Oregon	Oct. 13
Repair stations—Continued.	
Opened—Continued.	
Kintyre, Mont	Apr. 1
Closed:	
Bordeaux, Wyo	Oct. 28
Lakota, Dak	Jan. 15
Display stations.	
Opened:	
Whitehead, Me	May 1
Whitefish Point, Mich	May 18
Closed:	
Booth Bay, Me	Jan. 31
Whitehead, Me	Do.
Southwest Harbor, Me	Do.
Bar Harbor, Me	Do.
Brunswick, Ga	Mar. 1
Special river.	
Opened:	
Greensborough, Pa	July 1
Mount Vernon, Ind	July 20
Closed:	
Albany, Oregon	July 1
Eugene City, Oregon	Do.
Wabasha, Minn	Apr. 1
Madison, Ark	May 10
Cotton region.	
Closed:	
Sour Lake, Tex	Dec. 31
Special rain-fall.	
Opened:	
Medford, Wis	Apr. 1
Closed:	
Rhinelander, Wis	Mar. 31
To be opened, 1889:	
Gettysburgh, Pa	July 1
Cumberland, Md	Do.
Woodstock, Va	Do.
Electrical.	
Closed:	
Boston, Mass	Sept. 1
Ithaca, N. Y	Do.
Terre Haute, Ind	Do.
Washington, D. C	Do.

* From date of sale of line.
† Or at earliest practicable date.
‡ To go into effect on completion of telegraph line.
§ To date March 23, 1888.

During the year many changes have been made, and a general rearrangement of the work performed at date of last annual report has resulted in a reduction of force and the transfer of a portion of the duties elsewhere.

The clerical force, which at last report numbered twenty-four (all of whom were enlisted men of the Signal Corps), has been gradually reduced to fifteen (all civilians except one).

DUTIES PERFORMED IN THE DIVISION.

The duties now performed in the stations division are as follows:

Making and recording observations and preparing all meteorological forms pertaining to the Washington City station; translating all telegraphic weather reports from Signal Service stations; writing bulletins; draughting and writing letters relative to errors in telegraphic reports; correspondence relative to removal of offices, closing stations, and opening new stations; recommending supplies for new stations; recommendations and correspondence relative to locating signal offices in Government buildings; recommendations covering the purchase of supplies and furniture for all stations.

Necessary action on those portions of the reports of inspectors relating to the conduct of station work, the maintenance of discipline in the enlisted force, and proposed improvements in the different branches of the service.

Draughting special orders assigning enlisted men to, and relieving them from, Signal Service stations; draughting general orders pertaining to the meteorological duties of observers; keeping "record of stations of enlisted men;" keeping "record of arrival and departure of enlisted men under orders to change station;" keeping "record of sickness and medical attendance." Examination of "abstracts of journal" from all stations. Preparation of monthly statement for the Chief Signal Officer and the disbursing officer showing cost of medical attendance and medicines incurred by each enlisted man on station. Keeping corrected list of "civilian assistants at stations." Preparing maps of proposed, and completed inspection routes. Preparing circular letters relative to meteorological work. Reading and correcting proof of matter sent to printer by this division.

Consideration of all matters relating to the display of "weather signals;" correspondence with displaymen; authorization of telegraphic service from proper distributing centers; furnishing displaymen with forms for reporting to State weather services; keeping record of action in proper books; conducting correspondence in connection with the "railway bulletin service," and making proper record of the same.

Correspondence with observers and others on the various special matters referred to this division for action.

Supervision of the work performed at 43 special rain-fall stations, and 115 special cotton-region stations; instructing the observers at these stations in their duties; providing for the erection of instrument shelters; conducting correspondence necessary in changing observers at special stations.

Keeping a record of all maps and other publications issued at stations, with persons and places supplied with same, and with frames for their display. Conducting correspondence relating thereto.

General supervision of the instruction of second-class privates in meteorological work.

Examination and correction of weather maps and bulletins issued at stations.

Keeping "Miscellaneous Book," containing a brief history of the establishment, removal, and closing of stations of the service, and other important facts in connection with each.

Keeping "record of weather signals," giving name of station, names of displaymen, rate of telegrams, etc.

Compilation of wind direction and velocity data from Washington City station records.

WASHINGTON STATION.

The removal of the Washington station from the old office to new quarters in the Fergusson building, Twenty-fourth and M streets, on August 21, relieved the crowded condition of the division, and the rooms now occupied are ample.

The observer uses the room in the cupola over the second floor as a station room. It affords easy access to the roof and the instruments located thereon, and is admirably adapted to the purpose. The cupola is located in center of northern edge of building, fronting north. The instrument shelter is directly above the skylight which covers the center of the cupola. The barometers are suspended from hooks near the center of the east wall of the room. The anemometer has been erected at the southwest corner of platform, immediately over roof of cupola, and the wind-vane at its southeast corner.

The rain and snow gauges are near the center of southern edge of roof of main building.

Observations were discontinued at the old office on March 21, and commenced at the new office with the 8 a. m. observation of March 22.

WORK TRANSFERRED TO OTHER DIVISIONS.

The examination of the original records, monthly meteorological reports, anemometer record sheets from regular second-order stations, and also that of the monthly reports from regular and special wind-signal stations, was transferred to the records division on January 1, together with the force employed on the same.

The preparation of data for the issuing of weather crop bulletins was transferred to the review division April 5.

Since January 1 the following items of business have been transferred from this division to the instrument division, viz:

(1) Recommendations to disbursing division to either call in or send out new instruments to stations.

(2) Locating the various instruments on the roofs of the office buildings, and obtaining correct diagrams showing their proper locations.

(3) Determining the exposure and height for the wind instruments and rain and snow gauges, and furnishing proper estimates for the same to the disbursing division.

(4) Keeping record of all instruments sent out and called in; also all changes in shelters and instruments.

(5) Record of instruments broken, and by whom.

The classes of work outlined below have been transferred from this division to the disbursing division, viz:

(1) Detailed instructions to observers in reference to calling for bids for either removal of office or changing location of any instruments.

(2) Recommendations as to the advisability of changing offices, and letters to observers covering the various points to be considered in making a selection of location for new office.

(3) Consideration of the purchase at this office of all supplies for stations, and recommendations covering all such purchases.

(4) Consideration of all bids received from stations, or at this office, for station supplies, and recommendations in reference thereto.

(5) Consideration of all requests from stations to make purchases thereat, and recommendations thereon.

(6) Making out specifications in full for all annual supplies and other supplies required from time to time for station use.

(7) Specifications for furniture for stations, and drawings showing the same.

(8) Recommendations as to sending furniture to particular stations and keeping a record of same.

(9) Recommendations as to the disposition of all property upon the closing of a station.

(10) Keeping account of the appropriation "Rents, etc., of offices."

(11) Action on all recommendations made by inspectors on Forms 27 and 131 as to changes in location of instruments, offices, etc., and sending out or calling in supplies.

(12) Inspection and test of all supplies purchased for stations.

On June 1 the correspondence, records, and general supervision of the river and flood service were removed from this division and placed in charge of Prof. Thomas Russell.

CHANGES IN TIME OF OBSERVATIONS.

The regular telegraphic observations heretofore taken at 7 a. m., 3 p. m., and 10 p. m., seventy-fifth meridian time, were discontinued on June 30, 1888, and on July 1 a new series, to be taken at 8 a. m. and 8 p. m., seventy-fifth meridian time, was commenced. The 3 p. m. observation was continued as a local observation, to be taken and recorded, but not to be telegraphed or used in computing the means. It was discontinued after December 31.

SPECIAL TELEGRAPHIC OBSERVATIONS.

On July 1 a system of special observations and reports was instituted. These observations are taken on the occurrence of sudden or violent changes in atmospheric conditions, and are designed to keep the forecasts official fully informed as to the existence and nature of such phenomena as have an important bearing in indicating probable future conditions. The instructions for taking these observations were prepared in detail and with great care, and the system has been successful in every particular.

SPECIAL 5 P. M. RIVER OBSERVATIONS.

On August 1 stations of the second order in cities which publish morning papers were directed to make a special river reading at 5 p. m. daily, and furnish the information to the press, together with the change in height of river since 5 p. m. of preceding day.

SPECIAL 7 A. M. OBSERVATIONS—SPECIAL HOURLY TEMPERATURE OBSERVATIONS.

On August 9 certain selected stations were instructed to take a full observation at 7 a. m. daily, corresponding to the 8 a. m. observation, to be continued until October 31. Special hourly temperature observations were also taken at a large number of stations from January 1 to March 31.

OBSERVATIONS AT THIRD-ORDER STATIONS.

Since January 1 the daily observations have been taken at 8 p. m. at stations of the third order. Prior to that date they were taken at sunset.

CHARACTER OF WEATHER.

The manner of recording the character of the weather, as indicated by the amount of clouds observed at the time of observation, was so modified by orders of December 21 that since that date clear weather has been recorded as "cloudless," and fair weather as "partly cloudy."

READINGS OF MAXIMUM THERMOMETER.

On July 30 instructions were issued to have the maximum thermometers read daily at all stations at the 8 a. m. and 8 p. m. observations, but to be set only at the time of taking the 8 a. m. observation, etc.

BAROMETER CORRECTIONS FOR INSTRUMENTAL ERROR.

The application of corrections for instrumental error to station barometer readings was discontinued on January 1 at all places where the correction was ±.006 or less.

CROP BULLETINS.

On October 10 the Weekly Crop Bulletin was discontinued for the season and a monthly bulletin directed to be issued. The Weekly Crop Bulletin was resumed on March 1.

FROST.

During July the system of frost warnings, which have been conducted by the telegraph division, was transferred to this division.

There appearing to be some necessity for a change in the manner of recording and reporting frost, instructions were issued in November directing that, in autumn, all frosts be recorded from the date of occurrence of the first frost until the date on which the minimum temperature of 30° occurred. In the spring all frosts after the dates given will be reported as indicated below.

South of latitude 30°, or in California, Oregon, or Washington Territory, after February 15.

South of latitude 33°, after March 1.

South of latitude 35°, after March 15.

South of latitude 38°, after April 1.

South of latitude 40°, after April 15.

Frosts occurring at any station after April 30 will be reported.

RENOVATING STATIONS, INSTRUMENTS SUPPLIED, ETC.

On December 14 the various stations were informed that it was the desire of the Chief Signal Officer to have the signal offices throughout the country put in as good condition as practicable with the appropriation available, and observers were directed to report:

(1) Whether the thermometer shelter and support, wind-instrument supports, rain and snow gauge supports, and board walks need painting or repairing; and if so, give probable cost.

(2) Whether any of the furniture needs repairing or revarnishing; if so, give estimated cost.

(3) Whether any new furniture is required; if so, report articles on hand and the number of each desired.

Under the first heading sixty-nine shelters and supports, fifty-seven wind-vanes and supports, fifty-eight anemometer supports, and the board walks at twenty-seven stations were painted, and all necessary repairs made.

Under the second the furniture at forty-eight stations was repaired and revarnished.

Under the third heading the following furniture was purchased and sent to the various stations: 41 oak desks, 5 roll-top desks, 69 self-register stands, 83 New York spring revolving chairs, 76 Douglas office chairs, 40 oak tables, 70 oak book-cases with glass sliding doors, 39 washstands, 127 curtains, 11 stoves; besides covering the floors of 36 offices with linoleum and 3 with carpet.

The standard thermometer shelter has been erected at four stations.

The standard Maring anemometer support has replaced the old support at eight stations during the year, and 16 stations have been supplied with new 6-foot wind-vanes and anti-friction rollers.

During the year self-registering instruments for recording the direction and velocity of the wind and the precipitation were sent to Boston, Chicago, Cincinnati, Detroit, New York City, New Orleans, St. Louis, San Francisco, Savannah, and Washington.

Self-registers for recording the direction and velocity of the wind were sent to Bismarck, Buffalo, Cleveland, Dodge City, Galveston, Marquette, Norfolk, and Omaha, and a self-recording rain-gauge to Jupiter, Fla.

REMOVAL OF OFFICES.

The signal offices at the stations of the second order at Atlanta, Atlantic City, Baltimore, Columbus, Fresno, Lexington, Los Angeles, Memphis, Montrose, Palestine, San Diego, Titusville, and Valentine were removed into quarters better adapted to the requirements of the service and where the instruments would have a more favorable exposure, and those at Des Moines, Erie, and Fort Stanton into Government buildings.

Arrangements have been made and instructions issued for the removal of the offices at Dubuque and Nashville into better quarters, and for that at Marquette into the Government building on July 1, 1889.

Arrangements have also been made whereby the offices at Augusta, Charlotte, Duluth, Eastport, El Paso, Fort Smith, La Crosse, Leavenworth, Louisville, Pittsburgh, San Antonio, Wilmington, and Wichita will be moved into Government buildings as soon as the buildings have been completed.

List of stations of the second order now located in public buildings.

Locality of stations.	Character of building.
Albany, N. Y	Public building.
Apache Fort, Ariz	Military post building.
Assinniboine, Fort, Mont.	Do.
Bismarck, Dak	Quartermaster's building.
Buford, Fort, Dak	Military post building.
Boston, Mass	Custom-house.
Cairo, Ill	Public building.
Canby, Fort, Wash	Signal Service building.
Chattanooga, Tenn	State court-house.
Cincinnati, Ohio	Public building.
Custer, Fort, Mont	Military post building.
Des Moines, Iowa	Post-office building.
Du Chesne, Fort, Utah	Military post building.
Elliott, Fort, Texas	Do.
Erie, Pa	Custom-house and post-office.
Grant, Fort, Ariz	Military post building.
Harrisburg, Pa	Post-office.
Jupiter, Fla	Signal Service building.
Kansas City, Mo	Custom-house and post-office.
Kitty Hawk, N. C	Signal Service building.
Knoxville, Tenn	Public building.
Maginnis, Fort, Mont	Military post building.
Mobile, Ala	Public building.
Mount Washington, N. H.	Signal Service building.
New London, Conn	Public building.
New Orleans, La	Do.
Omaha, Nebr	Do.
Oswego, N. Y	Do.
Pensacola, Fla	Do.
Philadelphia, Pa	Do.
Pike's Peak, Colo	Signal service building.
Port Hnron, Mich	Public building.
Parkersburgh, W. Va	Court-house and post-office.
San Antonio, Tex	Headquarter's office building.
Sandusky, Ohio	Public building.
Shreveport, La	Do.
St. Louis, Mo	Do.
Sill, Fort, Ind. Ter	Military post building.
Springfield, Ill	Public building.
Stanton, Fort, N. Mex.	Military post building.
Sully, Fort, Dak	Do.
Toledo, Ohio	Post-office and custom-house.
Tatoosh Island, Wash	Signal Service building.
Washakie Fort, Wyo	Military post building.
Whipple Barracks, Prescott.	Do.
Wood's Holl, Mass	Fish Commission building.
Yuma, Ariz	Quartermaster's building.

REVISED WEATHER CODE.

During January and February the "Weather Code" (for enciphering telegraphic weather reports) was revised and a new edition printed at this office and furnished stations. It went into operation April 1.

Much labor was expended in making this revision, and it is believed that the code as now used will prove satisfactory in all respects.

In the original a large number of arbitrary words, not translatable at sight, were used. These are omitted from the present edition, and words substituted which conform to the key. All words now appearing in telegraphic weather reports (except the river cipher) are in accord with the key, and the time necessary in translating into ordinary language is thus reduced to a minimum.

The instructions for using the code were revised and simplified, and experience has demonstrated that no difficulties have arisen on the part of observers in fully comprehending them.

RESUMPTION OF WEATHER REPORTS FROM THE WEST INDIES.

West Indies weather reports were first telegraphed to this office in 1873, from Havana, Kingston, and Santiago de Cuba. In 1874 St. Thomas, Guadeloupe, and Barbadoes were added. These reports were received up to 1881, when they were discontinued through failure of appropriations.

In January this office was informed that the Spanish Governmont had placed its meteorological service under the navy, and under the direct supervision of the director of the naval observatory at Havana; that the service would be inaugurated about January 15.

The Chief Signal Officer promptly informed the director at Havana that the prospect of the establishment of a West Indies meteorological service, under the control of the Spanish Government, was highly gratifying, and tendered the full co-operation of the United States Signal Service in the exchange of such reports as would be to the mutual advantage of the commerce of the West Indies and of the United States.

The organization of this Spanish-Cuban meteorological service has been carried forward with great energy on the part of those officials charged with its management, and the results already attained give assurance of inestimable benefits to commerce through systematic and accurate information of existing atmospheric conditions in the West Indies and on the South Atlantic and Gulf coasts.

Arrangements were made during June by the Chief Signal Officer and Mr. Luis E. Carbonelly, director of the naval observatory at Havana, Cuba, for sending daily, by cable from Havana to Key West, reports of observations taken at Havana, Santiago de Cuba, Jamaica, Puerto Rico, Santa Cruz, Antigua, and Barbadoes, and for sending from Key West to Havana, daily, reports of observations taken at Charleston, Galveston, Key West, and New York City.

A plan has been devised by which Mr. Carbonelly will also be informed of the location and character of any marked atmospheric disturbance in that section of the United States south of the fortieth parallel of latitude and east of the twentieth meridian of longitude.

COTTON-REGION OBSERVATIONS.

Cotton-region observations were continued until October 31; they were resumed on May 1. On June 1 the manner of transmitting these reports to centers was changed so as to have them sent at circuit rates. The compensation of observers remains unchanged.

A new Weather Code, to be used by cotton-region observers, was prepared and sent to stations in the latter part of May. It went into effect June 1.

RIVER AND FLOOD SYSTEM.

In February an extended report on the river and flood system was prepared with the recommendation that a thorough reorganization of the service be made; also, a supplemental report on the same subject in April. The plans were approved by the Chief Signal Officer and are to go into effect on July 1, 1889.

A new edition of the "Instructions to Special River Observers" has been prepared and printed, covering all the changes in this branch.

WIND SIGNALS.

No important changes have been made in the system of wind signals during the year. They have continued to give general satisfaction, and the number of stations displaying them could have been largely increased with manifest advantage to shipping interests, but owing to the limited appropriation no increase could be made.

Signals were discontinued for the winter season as follows:

On Lakes Huron, Michigan, and Superior (except at Milwaukee, Grand Haven, and

Ludington) on December 1; on Lake Erie, December 6; on Lake Ontario, December 10.

Signals were resumed in the spring as follows:

At regular stations on Lakes Erie and Ontario (except Sodus Point, N. Y., and Ashtabula, Ohio), on April 21; at regular stations on Lakes Michigan and Huron, on April 15; on Lake Superior and at all other display stations on the Great Lakes on May 1.

WEATHER SIGNALS.

The number of points supplied with forecasts and warnings at Government expense for the display of weather signals remains about the same as at the beginning of the fiscal year, the stations added from time to time during the year being nearly equal to those discontinued at various times; the total now supplied is 1,056.

On October 22, displaymen were requested to render their monthly reports of displays and verifications to designated State weather service centers, instead of to this office.

On November 1, Galveston, Tex., was made a distributing center for eastern Texas, and on November 15 stations in that section, formerly supplied from New Orleans, La., were transferred to Galveston center.

The change in time of sending out forecasts from this office, which went into effect at the beginning of this fiscal year, necessitated a corresponding change at distributing centers. With the exception of Galveston (which, since December 10, has sent out the 8 a. m. forecasts), these centers have distributed the 8 p. m. forecasts, which cover the period for twenty-four hours from 8 p. m. of the day they are made up; thus it frequently happens that very many points do not receive the forecasts until one-half to three-fifths of the time covered thereby has passed. This has been a subject of much complaint from displaymen, but no remedy can be suggested so long as the forecasts cover the time stated and the local offices are not open for the receipt of telegraph business until 8 o'clock in the morning.

Beginning August 4, the 8 a. m. and 8 p. m. forecasts were made to cover the period of twenty-four hours from the current observation, instead of thirty-six hours, as was the rule before that date.

The usual annual telegraphic appropriation for the next fiscal year having been reduced, it became necessary to take action to reduce the number of stations supplied with the forecasts at Government expense, and on June 1 each displayman was requested to state, on or before June 20, whether any special causes demanded the continuance of the reports to his address, as it was deemed but just to give such due consideration in making the reduction. The result was that the forecasts have been discontinued to 235 persons who failed to reply to such request or offered no sufficient reason for their continuance.

PRINTED WEATHER MAPS.

Prior to July 1 the stations at Boston, Cincinnati, Kansas City, New York, and St. Louis were supplied with printing presses, logotypes and type stands, and on the date named the publication of printed weather maps was commenced at each. In addition to posting these maps in prominent places, for the benefit of the public, and furnishing them to corporate bodies in the cities where issued, they have been distributed by the earliest mails throughout the country, to such towns as could be reached within a few hours after issue, and where the information they contained would be of the greatest value to the community.

Postmasters at places of over five hundred inhabitants were enlisted in the work, and induced to post the maps in conspicuous places in their offices as soon as received. Frames were furnished in which to display the maps, and also additional frames for holding printed explanations. In addition to the foregoing, observers at map stations corresponded with the mayors of towns and cities, the Boards of Trade, or other corporate bodies, in order to obtain for the maps as wide a circulation as possible. The issues became so large that it was necessary to refuse all requests from private parties, except in cases where the public would be benefited equally with the recipient.

The following figures show the issue of these maps at the printing stations. With the exception of Cincinnati, all issue printed maps both in the forenoon and afternoon.

[Total daily issue.]

Boston	407	St. Louis	169
Cincinnati	81	Washington City	355
Kansas City	219		
New York City	344	Total	1,575

CYCLOSTYLE MAPS.

Maps are also issued by the cyclostyle process at a large number of stations, and they have found such marked favor that at many places the entire edition is now used for public display, or for the use of Boards of Trade, Chambers of Commerce, and Cotton Exchanges.

The following list shows the stations distributing these maps, and the number of copies issued daily at each:

	Daily issue.		Daily issue.
Augusta, Ga	26	Memphis, Tenn	21
Buffalo, N. Y	105	Milwaukee, Wis	28
Chicago, Ill	31	Nashville, Tenn	28
Cleveland, Ohio	50	New Orleans, La	50
Columbus, Ohio	19	Norfolk, Va	14
Denver, Colo	30	Pittsburgh, Pa	59
Des Moines, Iowa	7	Sandusky, Ohio	50
Detroit, Mich	60	Savannah, Ga	23
Erie, Pa	32	Springfield, Ill	25
Galveston, Tex	5	Toledo, Ohio	22
Indianapolis, Ind	17	Wilmington, N. C	8
Jacksonville, Fla. (November 15 to May 15, each year)	15	Total	725

Arrangements were made in February to have the office file of the maps at these stations from the commencement of the issue to December 31, 1888, cheaply and substantially bound, in order to preserve them for ready reference.

As a rule, a copy of the printed "explanations," with a frame in which to display the same, has been sent to all stations furnished with maps, to be posted in connection with them.

LOCAL FORECASTS.

Early in June the Chief Signal Officer authorized certain officers and observers to make local forecasts of the weather for the immediate vicinity of their stations, beginning July 1, 1889. These forecasts will be confined at first to an expression of opinion as to the weather and temperature or as to whether or not precipitation will occur during the following twenty-four hours, such terms as "fair weather," "rainy," "light showers," "rain at intervals," etc., being used.

The inauguration of this system during the coming year will mark a new departure in the administration of the service. The duty of making forecasts for the entire country is at present confined strictly to the forecast officials at Washington City and at San Francisco. On July 1 such officers and observers throughout the United States as have been specially selected and are considered competent from long experience and study of local weather conditions will be permitted to put their knowledge to a practical use in the matter of forecasting precipitation, etc., for their locality.

It is believed that the operations of this system will be attended by results of the highest importance and benefit.

TOTAL ABSENCE DUE TO SICKNESS.

Total number of days the enlisted men of the Signal Corps were absent from duty on account of sickness during the fiscal year, 890; .08 per cent.

TOTAL ABSENCE WITH LEAVE (INCLUDING FURLOUGHS).

Total number of days the enlisted men of the Signal Corps were absent from duty on account of leaves of absence and furloughs granted during the fiscal year, 2,861; .25 per cent.

SPECIAL REPORTS FOR THE BEFEFIT OF THE FRUIT AND SHIPPING INDUSTRIES OF SOUTHERN CALIFORNIA.

For the past two years special weather reports and special bulletins of approaching cold waves east of the mountains have been sent to and issued by the observer at Los Angeles during the raisin-making, orange-growing, and fruit-shipping period for the benefit of producers and shippers.

The records of the Southern Pacific and Santa Fé Railroads show that 2,500 car-loads (or 180,000,000) oranges were shipped from southern California during this year.

To ascertain the value of the special weather reports to those in whose interest they were issued, the observer at Los Angeles, on May 24, addressed a circular letter to the leading shippers of fruit and agents of the transcontinental railroads in his vicinity soliciting an expression of their views. The following is an abstract of the replies:

"LOS ANGELES, CAL., *May* 30, 1889.

"* * * We take pleasure in testifying to the value and utility of the weather reports supplied through your station. The reports of approaching rain storms during the fall seasons, when raisins and dried fruits are curing, are of great advantage, and no doubt prevent heavy losses by enabling the producers to protect the crops from rains. The eastern temperature reports and notices of approaching cold waves east of the mountains are also of great benefit in enabling shippers of California oranges to protect the fruit en route and to use proper judgment when loading cars, thus avoiding loss.

"GERMAIN FRUIT COMPANY."

"LOS ANGELES, CAL., *May* 29, 1889.

"* * * During the winter months, when perishable fruits and vegetables are shipped in large quantities to eastern points, these reports are of great value to shippers as indicating weather to be expected while contemplated shipments are en route.

"WILLIAMSON DUNN,
"*General Agent California Central Railway Company.*"

"RIVERSIDE, CAL., *May* 29, 1889.

"* * * Your reports on temperature, winds, and approaching cold waves have been of incalculable benefit to this community and regret that the service can not be further advanced. If the Department could give us daily reports by wire it would greatly assist our section. Last season your timely wired advices saved our people from great loss. If the Department, as already stated, could give us daily reports, we would gladly inform the entire valley of anticipated adverse changes, etc.

"BOYD & DE VINE,
"*Warehousemen and Commission Merchants.*"

"LOS ANGELES, CAL., *May* 29, 1889.

"* * * The weather reports, such as you furnished us with during the winter, were of great value to us in connection with our orange shipments to points east of the Rocky Mountains, and we trust you will arrange to furnish these reports daily next winter, beginning say December 1, and ending say April 30. The special reports issued from time to time in regard to prospective changes in the temperature of various eastern points are also of great value to us.

"EARL FRUIT COMPANY."

"LOS ANGELES, CAL., *May* 31, 1889.

"* * * We have always esteemed the Signal Service reports of value to the shipping industry, especially during the winter season. * * * Any information relative to approaching cold waves east of the mountains, or approaching local storms, is of value to either the raisin or orange industry.

"W. R. STRONG & CO."

"LOS ANGELES, CAL., *June* 1, 1889.

"* * * I have no hesitation in saying that in my judgment these reports have not only a great general value, but are particularly useful to the transcontinental railroads during the early part of the orange-shipping season, say January 1 to April 1, during which time the weather east of the Sierra Nevada Mountains is subject to great extremes. By close study of these reports we are enabled to anticipate with considerable degree of certainty the character of weather likely to be encountered by any particular shipment, and to take such precautions as to its handling as may seem necessary.

"C. F. SMURR,
"*Assistant General Passenger and Freight Agent, Southern Pacific Company.*"

"LOS ANGELES, CAL., *June* 4, 1889.

"* * * Regarding my opinion of the value and utility of the weather reports issued during raisin and fruit shipping season, permit me to express myself as heartily favoring the continuance of the reports. While the effect of cold waves on the raisins transported might not be appreciable to any great degree, yet the knowledge of the probable temperature through which green fruit and vegetables would be likely to pass would largely enter into the class of cars to be used for such transportation from this end, as also the time and attention it would be necessary to give the fruit while passing through the cold territory. Altogether I have found the reports of great service. * * *

"A. J. HECHTMAN,
"*Agent Union Pacific Railroad, Freight Department.*"

"LOS ANGELES, CAL., *June* 4, 1889.

"* * * I have made inquiries of a large number of our shippers, and from what they all say, and from my personal experience of the inquiries they make regarding your reports (knowing them to be in the rooms of this board of trade) I am of the opinion that the reports are almost indispensable. I find that our shippers, especially in the orange season, rely entirely upon the reports issued from your office as to when they will start their cars and when to hold them, and I am credibly informed that upon the reports issued from your office great losses have been saved, and the strong desire among our shippers is that the service in this respect be maintained fully rather than in anywise diminished, and I hope that the department of the Government which you represent here will fully appreciate the great necessity of your reports, and will make such appropriation as will enable you to comply with the increased demand that will be made upon you in this respect, which is sure to come.

"T. H. WARD,
"*Secretary Board of Trade.*"

"LOS ANGELES, CAL., *June* 4, 1889.

"* * * It is hardly possible for us to estimate the actual value of your reports during our raisin season, which commences about the 1st of September, at a time in the year when rains are liable to come and without warning, and we can hardly protect ourselves without the benefits derived from your reports.

"We have also found your special bulletins of approaching cold waves east of the mountains to be of great benefit to us in shipments of green fruits, especially during this late orange season, and consider that could you supply us with the same information during the grape season you will benefit us as well as other shippers, for while the effect of cold upon grapes in their cured state is not necessarily disastrous, should we conclude to ship the grapes green your reports would almost be a necessity. There is another matter to take into consideration, which is, during our raisin season our oranges are growing, and a bulletin to the effect of cold weather would enable us to notify our growers to protect their oranges against frost. We have nothing but praise for the service you have given us this last season, especially during our early heavy shipments of oranges.

"COOK LANGLEY,
"*Commission Merchant.*"

REDUCTION IN NUMBER OF TELEGRAPHIC WEATHER REPORTS.

The amount appropriated for telegraphing weather reports during the next fiscal year having been reduced, it became necessary on June 3 to take initiatory steps toward reducing the number of such reports received at the various stations during the coming year.

The following letter from the chairman of the meteorological committee at Kansas City, Mo., is a fair expression of the general sentiment of those interested with relation to the contemplated reduction:

"COMMERCIAL EXCHANGE, SECRETARY'S OFFICE,
"*Kansas City, Mo., June* 21, 1889.

"DEAR SIR: In regard to the contemplated reduction in the number of weather reports now received at this station, entirely or for a certain period when they could best be spared, owing to the insufficiency of the appropriations for the next fiscal year, we would earnestly request that no such action be taken if there be any possible means of avoiding it.

"The business interests of this city are so vast and far-reaching, including the receipts and shipments of vast quantities of grain, fruit, vegetables, etc., and also of large herds of beef cattle, hogs, and sheep, and the shipment yearly of pounds of dressed beef and kindred commodities to all sections of this country and also abroad, and the large amount of money invested by residents of this city in stock-raising, require full reports at all seasons of the year to enable us to take such precautionary measures as will best subserve business interests, so that any reduction in the number of reports would cause incalculable injury to the different industries interested in and benefited by these reports. In fact it has been our intention to request an increase in the number of reports now received, and also that this station be placed in direct communication, at the morning report at least, with the stations transmitting reports, instead of having to depend upon another station collecting these reports and then transmitting them to this point, thereby losing to us from one to one and a half hours, which we are informed by the observer here is the time elapsed between the receipt of the last report at St. Louis and at this station, thus losing to us so much of the most valuable time of the day, as it comes just at the time we are planning our shipments, etc., for the day, and is a great detriment to our best interests.

"If you will kindly suggest to us some means, either through co-operation with you or working on our own responsibility, whereby these results could be obtained for this city we will use our best efforts to accomplish the same. * * *

"Very respectfully,

"E. D. FISHER,
"*Chairman Meteorological Committee.*

"Brig. Gen. A. W. GREELY,
"*Chief Signal Officer, Washington, D. C.*"

CHANGES IN STATIONS OFFICER.

Lieut. Frank Greene relieved Lieut. F. R. Day as stations officer on July 1, 1888, and remained in charge until October 1, 1888, when he was in turn relieved by the undersigned, who has remained in charge to the present date.

Recapitulation of stations of the Signal Service in operation on June 30, 1889.

Stations of the first order (making continuous records by means of self-registering instruments)	1
Stations of the second order (taking two observations daily)	148
Stations of the third order (taking one observation daily, at 8 p. m.)	32
Repair stations on United States military telegraph lines	23
Special display stations	66
Special river stations	72
Special cotton-region stations	114
Special rain-fall stations	44
Total stations in operation	500

Respectfully submitted,

JAS. MITCHELL,
Second Lieutenant, Signal Corps, Assistant and Stations Officer.

The CHIEF SIGNAL OFFICER.

APPENDIX 10.

REPORT OF THE OFFICER IN CHARGE OF THE PUBLICATIONS DIVISION.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, June 30, 1889.

SIR: I have the honor to submit the following report concerning the publications division of the Signal Office for the fiscal year ending June 30, 1889.

At the close of the last fiscal year Second Lieut. Frederick R. Day, Signal Corps, was in charge. He was relieved by Second Lieut. John P. Finley, Signal Corps, on August 1, 1888. On August 15, 1888, Second Lieut. John P. Finley was relieved by Second Lieut. Fielder M. M. Beall, Signal Corps, who has continued in charge during the remainder of the year.

NATURE OF THE DUTIES PERFORMED IN THIS DIVISION.

This division is charged with the printing and distributing of the publications issued in connection with the Signal Service, such as the annual reports of the Chief Signal Officer, the Monthly Weather Review, the Summary and Review of International Meteorological Observations, the Daily Weather Maps, Weekly Crop Bulletin, general orders, circulars, forms, and such other miscellaneous work as may be found necessary from time to time. Besides the above routine work, the following special printing has been done: 8,500 copies of Instructions for Using the Heliograph; 250 copies Bibliography of Meteorology, Part I, Temperature; 500 copies Signal Service Weather Code, 1889; 250 copies Cotton Region Weather Code; 2,500 copies Dew-Point and Relative Humidity Tables; 500 copies of the Tri-Daily Meteorological Record Charts for June, 1878.

On July 1, 1888, a radical change was made in the way and time of printing the daily weather charts. Instead of writing out the several data and sending them to the printer, the printers are located in the forecast-room and furnished with logotypes of all the data used on the charts. As the reports are translated for the forecast-room clerks, the printers set them up for the chart by use of the logotypes. No difficulty has been experienced in the printers keeping up with this necessarily rapid dictation. By this process the charts are printed within twenty-five minutes after the last report has been translated. Such reports as are not received in time to go on a current chart are printed in tabular form on the next succeeding chart, with a proper descriptive heading. By this means the series of the semi-daily charts are completed and issued at once. They contain about all the data available, and form a satisfactory meteorological record both for current use and future study.

APPLICATIONS FOR PUBLICATIONS.

The applications for publications have greatly increased during the present fiscal year, as will be seen by the increased number of letters sent and received.

On account of considerable annoyance having been experienced by officials located in Washington City by the receipt of requests to secure for the writer the publications of this service, the following statement was published and has had the desired effect:

"SIGNAL OFFICE, WAR DEPARTMENT,
" *Washington City, April* 1, 1889.

"The Chief Signal Officer finds that an erroneous opinion prevails with a large number of persons to the effect that the publications of the Signal Service can only be obtained through the personal intervention of intermediate parties.

"It is the aim and desire of the Chief Signal Officer to distribute the publications at his disposal to such persons, corporations, and institutions as are entitled to them on account of their scientific pursuits, original investigations for educational purposes, or proposed application to agricultural, commercial, manufacturing, and other business transactions.

"The intervention or recommendation of a second party is unnecessary, except so far as to guarantee the standing and good faith of otherwise unknown parties. A simple application for what is wanted, with a brief statement as to the necessity for the same, addressed to the Chief Signal Officer, Washington, D C., will receive prompt attention.

"If the publications can not be furnished the applicant will be so informed.

"A. W. GREELY,
" *Chief Signal Officer.*"

The following publications printed at the Government Printing Office have been received and distributed:

The annual reports of the Chief Signal Officer for the year 1887, Parts I and II; the report for the year 1888; a report of rain-fall in Washington Territory, Oregon, California, Idaho, Nevada, Utah, Arizona, Colorado, Wyoming, New Mexico, Indian Territory, and Texas from two to forty years; a report on the climate of Oregon and Washington Territory, and the report of the Lady Franklin Bay Expedition, Volumes I and II.

Through the promptness of the Public Printer, the annual report of the Chief Signal Officer for the year ending June 30, 1888, was printed and distributed within eight months after it was rendered to the Secretary of War. This is unusual.

THE LADY FRANKLIN BAY EXPEDITION REPORT.

The 750 copies of the report of the Lady Franklin Bay Expedition, Volumes I and II, have been distributed in accordance with the following resolution of Congress, viz.:

"IN THE HOUSE OF REPRESENTATIVES, *June* 17, 1886.

"*Resolved by the House of Representatives* (*the Senate concurring*), That 4,500 copies, with the necessary illustrations, be printed of the report on the proceedings of the International Polar Expedition to Lady Franklin Bay, Grinnell Land, by First Lieut. A. W. Greely, Fifth Cavalry, U. S. Army, Acting Signal Officer, 1,250 copies of which shall be for use of Senate, 2,500 copies for use of House, and 750 copies for distribution by the Signal Office to foreign libraries and Arctic explorers."

It is to be regretted that such a small number of copies of so valuable a report was allowed this office for distribution, as a large number of applications for it have been received from persons and institutions who desire it for scientific purposes, but could not be supplied.

STATEMENT SHOWING THE NUMBER OF LETTERS SENT, THE NUMBER OF LETTERS RECEIVED, THE NUMBER OF PUBLICATIONS, AND THE TITLE OF EACH PUBLICATION DISTRIBUTED.

Letters received	2,335
Letters sent	1,277
Annual reports of the Chief Signal Officer distributed	7,436
Report on rain-fall from two to forty years, Senate Executive Document No. 91, distributed	1,011
Report on the climate of Oregon and Washington Territory, Senate Executive Document No. 282, distributed	382
Advance report of the Chief Signal Officer for the year 1888, distributed	1,361
Appendices of the report of the Chief Signal Officer for the years 1882, 1885, 1886, 1887, and 1888, distributed	2,987
Monthly Weather Reviews distributed	32,400
Daily weather maps, 8 a. m., distributed	73,220
Daily weather maps, 8 a. m., backed by the 8 p. m. maps, distributed	22,630
Daily weather maps, 8 p. m., distributed	39,885
Report of the Expedition to Point Barrow, Alaska, distributed	139
The report of the Lady Franklin Bay Expedition, Volumes I and II, distributed	1,500
Report on the Contribution to the Natural History of Alaska, distributed	356
Report upon the Natural History Collections made in Alaska, distributed	825
United States Signal Service weather code, 1889, distributed	311
Bibliography of meteorology, Part I, temperature, distributed	178
Tri-daily meteorological record for January, February, March, April, and May, 1878, distributed	680
General subject indexes to the Monthly Weather Reviews, the annual reports of the Chief Signal Officer to 1887	259
Bound daily international bulletins distributed	694
Bound daily bulletins distributed	216
Professional papers	276
Signal Service notes	373
Bound weather maps (volumes) distributed	331
Bound volumes of Monthly Weather Reviews distributed	442
Charts showing the rain-fall in the United States for each month from January, 1870, to December, 1873, distributed	310
Daily international charts distributed	24,396
Summary and review of international meteorological observations distributed	2,787
Tri-daily weather maps distributed	8,918
Bound summary and review of international observations distributed	84
Miscellaneous pamphlets distributed (estimated)	3,000
Total	**230,999**

STATEMENT OF THE WORK PERFORMED IN THE PRINTING ROOM DURING THE FISCAL YEAR ENDING JUNE 30, 1889.

Title of work.	Impressions.	Title of work.	Impressions.
PRINTING.		LITHOGRAPHING.	
Weather Crop Bulletin	14,080	Base maps	353,024
General Orders	45,830	Daily weather maps	175,053
Special Orders and Instructions	8,700	Tri-daily weather maps	28,625
Circulars	5,665	Daily international maps	27,600
Monthly Weather Review	255,100	Monthly Weather Review maps	176,593
Monthly Summary and Review	13,850	Monthly summary and review maps	4,850
Letter-heads	122,080	Forms and circulars	277,279
Letters	27,650	Bibliography of Meteorology, Part I, Temperature	48,005
Forms	420,275	Specifications and drawings	5,134
Envelopes	127,000		
Wrappers	55,000		
Miscellaneous	92,689	Total	1,095,663
Total	1,182,969		

The total number of employés in the division at the close of the year is twenty-one, the same as at the last report, consisting of fifteen enlisted men and six civilians, classed as follows, viz.:

Clerk	1	Assistant pressman and feeder	1
Foreman of printing	1	Feeder and assistant to lithographer	1
Proof-reader	1	Engineer	1
Printers	8	Stitchers and folders	2
Lithographers	4		
Pressman	1	Total	21

Mr. John K. Robinson has continued as foreman in charge of the printing room, and Mr. C. J. Jones in charge of the bindery and distribution sections of the division. It affords me pleasure to report the continued zeal and efficiency of these gentlemen in their respective work.

F. M. M. BEALL,
Second Lieutenant, Signal Corps, Publications Officer.

The CHIEF SIGNAL OFFICER,
Washington, D. C.

APPENDIX II.

REPORT OF THE ASSISTANT PROFESSOR IN CHARGE OF THE INSTRUMENT DIVISION.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington, D. C., July 1, 1889.

SIR: I have the honor to submit the following report of the work of the instrument division for the fiscal year ending June 30, 1889.

At the close of the first five months of the year Assistant Professor T. Russell, then in charge of the division, was relieved, to be assigned to special duty in connection with cold-wave prediction, and on December 1 Assistant Professor C. F. Marvin assumed charge. At this time also certain items of work pertaining to the control and maintenance of the supply of instruments on the various stations, including all correspondence relating to exposures or otherwise bearing in any way upon instruments, were transferred to this division from the stations division, which theretofore had performed most of such work. This assignment, in connection with former duties, results in bringing all the details of the exposure and supply of everything in the way of meteorological instruments at each of the regular stations under the supervision of one person, and is an important step in facilitating this part of the work of the service and in carrying it out on a uniform basis. The personnel of the division consists of one in charge, with three assistants.

The principal parts or the work of the division may be comprehended under the following items.

(1.) Supervision of supply and exposure of instruments on station.

(2.) Packing and issue of instruments, including a record of the same and of their return.

(3) Refilling of barometers and repairs.

(4) Comparison of all thermometers with standards and preparation of correction cards.

(5) Inspection and testing of all new supplies of instruments and materials.

(6) Preparation of designs with drawings and specifications of instruments to be purchased.

(7) The custody and care of standards and substandards and various special instruments, including the maintenance of various self-registering instruments in position at this office.

(8) Studies and experiments bearing upon improvement of all methods and instruments in use, and the development of new forms of apparatus.

The usual progress of the regular work of the division has been more or less embarrassed, and, in some instances, suspended, in consequence of the removal of the office to its new buildings, and in certain respects there is still more or less work to be done before the instrument-room and all its fixtures will be finally re-established. This occasion of removal affords an excellent opportunity, of which advantage is being taken, to place this important part of the service in a thoroughly satisfactory condition.

SUPERVISION OF INSTRUMENTS ON STATIONS.

This work occupies a large proportion of the personal attention of the official in charge. Since December 1 as complete a study as time has permitted has been made of the equipment and details of supply and arrangements of instruments on all the regular stations of the service. In addition to various changes resulting from removal of stations from one building to another, and the supervision of the arrangements for the exposure of the instruments on the new office, other alterations are made pursuant to reports and recommendations of inspectors, observers' letters, etc.

These urgent and important needs, thus reported from all the stations whenever they arise, call, in the aggregate, for a large amount of attention and consume the greater part of supplies. Whenever possible, however, and the supply is sufficient, old instruments that have been long in use and show signs of deterioration are replaced before any interruption of the record occurs or while its accuracy is unquestionable, and the equipment of the station is thus kept up to the highest standard of excellence. Many instruments thus replaced are subject to repairs which are duly made and the instrument held for issue.

Recognizing the advantages of continuous records, considerable attention has been given to the introduction, where possible, of self-registering instruments.

At about the close of last year forty self-recording thermometers were sent out to certain selected stations, and five self-recording aneroid barometers were similarly distributed; both instruments are of the manufacture of Richard Frères, of Paris. The instruments in the main, especially the barographs, have given general satisfaction. The thermographs, being exposed in the instrument shelter to all sorts of weather and subjected to the influences of the smoke and atmosphere of large cities, have, in some cases given out after a time and require overhauling. As no supply of extra instruments was on hand this recall has, in every case, resulted in an interruption of the record. These instruments could, no doubt, be greatly improved by replacing the watch movement now used for giving revolution to the cylinder of paper, by a better-made or stronger time-keeper, as this part is frequently very troublesome. Examination has shown that these thermometers are discrepant by two or three degrees or less, as compared with the mercurial thermometer, and it is therefore found necessary to correct their readings.

To facilitate the difficulty of calculating the interpolated hourly corrections necessary to make the thermograph readings accord with those of the mercurial thermometer, a graphical correction card was devised, consisting of a small card having vertical hour lines ruled across it and provided with slight notches in the edges parallel to these lines. A thin rubber band stretched across the card from notch to notch and in any more or less inclined position according to the amount of difference observed between the thermograph and mercurial thermometer at two consecutive 8 o'clock observations, will cross the hour lines at points giving the correction for the thermograph reading for that hour. This card has proved of great service in securing an accurate record from these instruments.

A number of special thermographs of the Richard construction, but differing from the above in that the registration on the moving paper instead of being direct is effected electrically at a distant point have been purchased. One of these was displayed at Boston, in January, at the loan exhibition of the New England Meteorological Society, and was afterwards put in operation at the Boston signal office. The remainder are now undergoing systematic tests and being adjusted to working condition.

During the past month one of the registers was put in operation in the indications-room of this office, the thermometer being in the instrument shelter on the roof of the main building, the connections between the two consisting of six strands of wire each over 500 feet long.

In the past year eleven so-called triple registers, recording rain-fall, wind direction, and wind velocity, were purchased, and after being thoroughly examined and adjusted to working condition, ten were sent out on stations, accompanied, as far as possible, by the necessary accessories in the way of attachments to wind vanes, multiple conductor cable for electrical connections, and other fixtures.

These have also given general satisfaction, but some are not yet in operation in consequence of a delinquency of a contractor in furnishing certain supplies of wind vanes and self-registering fixtures, a matter that is still pending, but that is soon to be completed.

The rain-gauge in use with this triple register is in most respects identical with the ordinary standard rain-gauge of the service, to which are simply added the recording devices. The registration is effected electrically in a manner identical with that in use with the anemometer; each mark representing .05 inch of rain-fall.

PACKING AND ISSUE OF INSTRUMENTS.

The work of this class that belongs properly to this division is confined only to thermometers, barometers, and certain self-registering and special instruments. The delicate and fragile character of these require special skill and experience in handling and shipping. In order at any time to be able to trace and know the location and disposition of the large amount of Government property that, in this connection, passes through the instrument division, a careful record, by station and instrument, is kept of all transfers either to or from this office.

The accompanying statement indicates the instruments received and issued:

Description.	Received.	Issued.
Barometers	100	68
Thermometers	754	1,003
Anemoneters	97	68
Anemoneter self-registers	87	22
Clocks	5	7
Thermographs	7	10
Compasses	5	2
Evaporometers	0	8
Apparatus (thermometer-whirling)	0	4
Rain-gauges, self-recording	40	19

REFILLING AND REPAIR OF BAROMETERS.

The importance of accurate pressure observations and the ease with which barometers deteriorate or become entirely unserviceable necessitate their frequent change and repair, which, in most cases, consists in supplying a new tube. All Signal Service barometer tubes are now filled in the most approved manner in this division. Their scales are carefully adjusted so that the readings agree as nearly as possible with the standard barometer, and when the best adjustment attainable, except by prolonged trial, is secured, the correction for instrumental error is carefully determined by comparison with the standard. These corrections never exceed ±.006 inch, and are generally much smaller.

Various other repairs and adjustments are made in certain self-registering instruments of a delicate character, which are carefully examined and put in complete working condition before issue.

COMPARISON OF THERMOMETERS.

All new thermometers, and from time to time various old ones, are compared with standards and their corrections calculated and cards made out. During the past seven months 596 thermometers were thus compared.

Since the removal to the new office permanent provisions are being made for the work connected with the comparison of thermometers and general improvements made in the appliances so that the work may be conducted with greater facility and accuracy.

INSPECTION OF NEW SUPPLIES.

All instruments and supplies connected therewith, viz, anemometers, self-registering instruments, rain-gauges, instrument shelters, instrument supports, wire cable, etc., have been thoroughly inspected and tested before accepted.

DRAWINGS AND SPECIFICATIONS.

All drawings and specifications for the purchase of thermometers, self-registers, barometer cisterns, instrument supports, experimental apparatus, special instruments, etc., for the past year and many of those for the next year have been prepared in this division.

SELF-REGISTERING INSTRUMENTS AND STANDARDS.

The self-recording instruments which were taken down when the office was moved have not as yet all been replaced. One barograph has been maintained almost continuously. The record of wind direction and velocity is practically complete. The record of rain-fall is also nearly complete. An instrument platform is now in process of construction that is to be utilized in the erection of several pieces of self-registering apparatus. The office has in possession several instruments that, in some cases, are more or less duplicates of each other so far as the final record is concerned, but differ in style and detail of construction. It is thought best to set up only those which past experience has shown to be reliable in their action, though duplicates are desirable, and will be retained in particular cases where more than one is needed in order to preserve a complete record which might otherwise be broken, as the best of instruments of this kind are likely to fail sometimes. Some new pieces are also to be added, and plans are being perfected and carried out by which the whole system of instruments will not only be maintained in continuous operation, and valuable records thus obtained, but also be arranged in convenient order for practical illustration of the recognized methods and typical instruments for work of this sort, and for examination by those of the public who may have interest in such matters.

The important duty of the custody and preservation of the standard instruments of the service devolves upon this division. Of the themometers, only certain working substandards are kept at hand; the ultimate standards being more carefully preserved in a fire-proof vault of the War Department building. A discussion of the intercomparison of these with similar standards of other nations has been reported elsewhere and need not be repeated.

The standard barometer and several substandards are kept in the special room of the new building for this division. The removal of these instruments from the old office was conducted with every precaution and was attended with every success. The standard is an ordinary Fortin barometer of Adie construction, and though giving every evidence of being an excellent instrument of its kind, it possesses none of those peculiar qualifications properly belonging to a standard instrument of great and permanent accuracy. Monthly comparative readings are taken between the five special barometers serving as standard and substandards, but at present this is the only check there is on the office standard of pressure. The provisional normal barometer, temporarily set up for trial and experimentation some time since by Professor Russell, was completely dismantled when the office was moved and has not been used since. Admirable accessories in the way of a cathethometer and standards of length are now in the possession of the office, and it is hoped a normal barometer may be ultimately established.

Other important and valuable instruments serving as accessories to the regular instruments of the office are carefully preserved and maintained in working condition.

STUDIES AND EXPERIMENTS.

The experimental work upon anemometers which was begun in the latter part of June, 1888, was continued until September. The results of this work, however, have in part been already published in the Monthly Weather Review for February, 1889, and further details are to be submitted in special reports.

The large amount of time required for the proper performance of the work discussed above leaves but very little to be given to experimental study and investigation, which is, in this way, largely crowded out.

In addition to the work mentioned above in connection with the introduction of the triple registers, self-recording rain-gauges, and other special and new instruments, much of which work was largely experimental in its character, a variety of other questions have been under consideration and study and numerous experiments have been made, especially in anemometry. About the middle of January a few days were spent in Boston, New York, and Baltimore, visiting and consulting manufacturers and others interested in meteorological apparatus, especially self-registering instruments. Many different kinds of this latter class were examined at the loan exhibition of the New England Meteorological Society. At that time also, through the courtesy of its proprietor, Mr. A. Lawrence Rotch, I enjoyed the opportunity of a visit to the Blue Hill Observatory, where many of the best forms of meteorological instruments are kept in continuous operation. Mr. Clayton and Mr. Fergusson, the observers on this station, had attached to the recording mechanism of the dial of their Robinson anemometer a remarkably ingenious and simple device for rendering more legible the anemometer record as ordinarily obtained by use of the Gibbons register. The appliance was at once put on trial at this office and proves most valuable. All anemometers for repairs are now fitted up in this manner. The device consists simply in joining together, on the anemometer dial, two adjacent pins of those that operate to close the electric circuit corresponding to each mile of wind movement. The connection is made in such a manner that while these two pins are passing the contact spring the electric circuit is closed the entire time. There are ten pins on the dial, and it thus results that on the record-sheet the mile marks, which in high winds are close together and troublesome to count, are grouped in sets of ten, being clearly distinguished by the characteristic long mark that occurs on the passage of the connected pins. The counting of the record is not only thus facilitated, but an admirable check against accidental errors is also afforded, as but nine, and neither more nor less, mile marks can occur between any two consecutive long marks.

While in New York Dr. Draper's instruments in his meteorological observatory in Central Park were also examined and a few manufacturers and dealers consulted on certain points.

The thermographs of the Richard Bros., as well as those of other manufacturers, prove more or less satisfactory in general only when used in connection with the ordinary mercurial thermometers, or others of similar construction.

The regular air-temperature observations of the Signal Service are now taken by use of three thermometers, viz, the so-called exposed thermometer for giving the current air temperature, and the special maximum and minimum thermometers, and when the moisture conditions are measured still a fourth one is required. By the introduction of a thoroughly reliable and accurate self-registering thermometer, in addition to the advantage of a continuous and automatic record, the three separate instruments above mentioned could be dispensed with.

The mercurial thermometer leaves practically nothing to be desired as to its accuracy and performance, but its self-registration seems very difficult to accomplish; nevertheless, it would seem that the high state of perfection and simplicity to which modern photographic processes have been brought offer many opportunities for the construction of self-registering mercurial thermometers possessing all the latter's accuracy and admirable qualities. One important objection, however, is found in the necessity for artificial illumination at night time. It is doubtful, however, if this would prove much more objectionable, after one had become accustomed to it, than the ordinary electric batteries now used with the anemometer and some other instruments. This certainly affords an interesting and promising field for experimental study.

When the temperature falls 20° after correction for diurnal range within twelve hours after the time of the 8 a. m or 8 p. m. observations on which the cold-wave signal is based and goes below 40° the signal is counted as late.

A fall of twenty degrees or more in temperature in twenty-four hours or less and going below forty degrees when no signal has been ordered is called a severe cold wave without signal.

The method of computing the percentage of verifications given above is as follows: Add to the product of 100 by the number of verified signals less those ordered late, the product of the number of partially verified signals and late signals multiplied by 75, divide the sum of the products by the total number of signals ordered, plus one-half the number of severe cold waves without signals.

The rule according to which the above percentages are computed is different from the rule which has been in use in previous years. Formerly, also, cold-wave flags were allowed to be displayed for forty-eight hours and even more. When a verifying fall of temperature occurred any time within the period for which the signals were ordered they were considered fully verified. The widening of the period during which a cold wave may be verified largely increases the chances of its verification. A series of cold-wave signals if allowed to run thirty-six-hours will, it is estimated, verify 15 per cent. higher according to the above rules than if allowed to run only twenty-four hours. Under the old rules in former years no account was taken in the verifications of severe cold waves occurring without signals.

When signals are ordered for only twenty-four hours the differences of the maximum temperatures on succeeding days can not be used in verifying. Neither can the differerences between the minimum temperatures on two successive days be used in verifying. When signals are ordered for thirty-six hours in the evening the two succeeding minimum temperatures can be used in verifying.

In former years cold-wave signals were not required to be ordered for so many stations in the far West as is the case now. As cold waves appear first in the west and progress eastward, it is not possible to forecast their occurrence so successfully there as farther east.

As the observations the past year were made at 8 a. m. and 8 p. m., and the temperature changes for twelve hours corrected for diurnal range and for twenty-four hours are used in the verification, it may easily happen that a twenty-degree fall in temperature may occur in some twenty-four hour interval without any such large daily change being shown on the map. If, for instance, the temperature begins to fall at noon and goes down ten degrees by midnight, and there is a farther fall of ten degrees by noon next day, and then the temperature begins to rise, there will be no fifteen or twenty degree changes recorded and a signal will not be verified. Under the old system of three observations daily there was not so much chance for this to happen, and the verifications of cold waves at that time have an advantage in this respect over those made now.

To show the extent to which the verifications might be affected by this, the number of twelve and ten degree falls of temparature in twenty-four hours are shown which occurred at places where cold-wave signals were displayed, which were not considered as verified, either wholly or partially. Many of these no doubt were really successful signals.

In some cases cold waves occurred two or three hours after the time for the signal had expired. In such cases no credit is given in the verifications. The signals, however, subserved the practical purposes for which they were intended. A notable case of this kind is Boston, on February 5.

On the other hand, a number of cold-wave signals, though technically verified, were in reality, all the circumstances considered, practical failures. It is a great and possibly unavoidable fault of the cold-wave warnings that no attention is paid to the time a low temperature lasts. When a cold-wave signal is ordered in the morning the temperature being, say, sixty-two degrees, and the temperature falls to forty-two degrees next morning, it is technically verified. If the temperature, however, rises sharply the next morning from forty-two degrees, the public is not satisfied that the display of the cold-wave signal was justified. The low temperature has lasted for only a few hours and at a time of the day when people not being much outdoors it is not very noticeable.

Several such cases have been noted where there have been unfavorable comments made in the newspapers on signals, and yet they were verified strictly within the rules.

An improvement has been introduced in the announcement of the cold waves that will diminish complaints from this source. It consists in stating in the telegram the temperature to which it is expected the temperature will fall by a certain time, instead of stating only the expected change, as heretofore.

The discomfort produced in cold weather by a fall in the temperature is dependent not only on the change in temperature, but also on the strength of the accompanying wind. No regard is paid in cold-wave announcements to what the wind is going to be.

People often imagine, when the wind is blowing very strong and the temperature is only six degrees lower than on the previous day, that a cold wave should have been announced.

The percentages of verifications in the table are computed according to the rule given.

The following are the percentages computed by giving full weight to the signals designated as late, and also to the partially verified signals, and leaving out of account the cold waves without signals. The signals designated late are signals verified twelve hours after the signal is hoisted.

	Per cent.
October, 1888	31.1
November, 1888	66.5
December, 1888	53.1
January, 1889	58.1
February, 1889	66.6
March, 1889	42.8
April, 1889	66.2
Mean	56.8

Even these figures, however, are not strictly comparable with the percentages in former years, on account of the longer interval permitted in forecasting in previous years, and the fact that it was considered a verification if the temperature fell fifteen degrees any time within the interval for which the forecast was made. Now the temperature has to fall fifteen degrees within twenty-four hours to be verified.

The following are the numbers of times during the various months, October, 1887, to April, 1888, that twenty degree falls in temperature occurred when no cold-wave warnings had been given. These comprise only the Signal Service stations for which cold-wave warnings were required to be issued at those times. They correspond very nearly, however, with the stations for which cold-wave warnings were required from October, 1888 to April, 1889. Bismarck and a few other places, however, are not among them.

Severe cold waves without signals.

October, 1887	141
November, 1887	177
December, 1887	112
January, 1888	129
February, 1888	109
March, 1888	142
April, 1888	115

The figures above are not strictly comparable with the line of figures in table designated as "Number of severe cold waves without signals," but are very nearly so. The numbers for 1888–1889 in table do not include twenty-degree falls in temperature, unless more than two such changes occur at neighboring stations. The greater number of twenty-degree changes in 1887–1888 is probably due also in large measure to the greater severity of the season than the one passed.

The figures indicate a marked diminution during the past season in the number of cold waves that have occurred without signals.

In the table following is shown for each station for each month the number of cold-wave signals ordered, the number verified, the number not verified, and the number of severe cold waves without signals:

Stations.	Oct. 1888.			Nov. 1888.			Dec. 1888.			Jan. 1889.			Feb. 1889.			Mar. 1889.			Apr. 1889.			Total, seven months.			
	Verified signals.	Not verified.	Cold waves without signals.	Verified signals.	Not verified.	Cold waves without signals.	Verified signals.	Not verified.	Cold waves without signals.	Verified signals.	Not verified.	Cold waves without signals.	Verified signals.	Not verified.	Cold waves without signals.	Verified signals.	Not verified.	Cold waves without signals.	Verified signals.	Not verified.	Cold waves without signals.	Total signals.	Verified signals.	Not verified.	Cold waves without signals.
New London	1	...	...	1	...	1	1	1	...	4	1	...	2	1	1	...	3	...	...	...	...	15	9	6	2
New Haven	1	...	...	1	...	...	1	1	...	3	2	...	2	1	1	...	3	...	...	...	...	15	8	7	1
Wood's Holl	1	...	...	1	...	1	1	1	...	2	3	...	3	2	...	...	3	...	...	...	...	17	8	9	1
New Brunswick	1	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	3	...	...
Portland	...	...	...	...	...	1	1	1	...	3	2	...	3	2	...	2	...	1	...	...	1	14	9	5	3
Boston	1	...	...	...	...	1	2	...	...	6	...	...	4	2	...	2	1	...	...	...	...	18	15	3	1
Manchester	...	1	...	...	...	1	1	1	...	5	...	...	3	2	...	2	1	1	...	...	...	16	11	5	2
Albany	...	...	...	1	1	1	2	...	1	4	2	...	3	3	...	1	...	1	...	...	...	17	11	6	3
New York	1	...	...	1	...	...	2	...	...	2	3	...	2	1	...	1	2	...	...	...	...	15	9	6	...
Harrisburg	...	1	...	2	1	...	2	...	...	1	2	...	2	1	...	1	2	...	...	...	...	15	8	7	...
Ithaca	...	...	...	1	...	...	3	...	...	1	2	...	...	...	...	...	...	...	...	...	...	7	5	2	...
Philadelphia	1	...	...	1	...	...	2	...	...	2	3	...	2	1	...	2	1	...	...	...	...	15	10	5	...
Baltimore	1	1	...	1	...	...	1	1	...	2	3	...	2	1	...	...	2	...	...	...	...	15	7	8	...
Washington	1	1	...	1	...	...	1	1	...	1	3	...	2	1	...	1	1	...	...	...	...	14	7	7	...
Lynchburgh	...	2	...	1	...	...	1	1	...	2	3	...	2	1	...	...	1	...	...	...	...	14	6	8	...
Norfolk	...	1	...	...	1	...	1	1	...	4	1	...	2	1	...	...	1	...	...	...	...	13	7	6	...
Charlotte	...	...	...	1	...	...	1	1	...	2	2	...	3	...	...	...	...	...	...	1	...	11	7	4	...
Raleigh	...	...	...	1	...	...	1	1	...	3	1	...	3	...	...	...	...	...	1	...	...	11	9	2	...
Wilmington	...	...	...	...	1	...	1	1	...	3	2	...	2	1	...	...	...	...	...	1	...	12	6	6	...
Columbia	...	...	...	...	...	...	1	1	...	...	...	...	1	...	...	...	...	...	...	...	...	3	2	1	...
Charleston	...	...	...	...	...	...	1	1	...	2	3	...	2	1	...	...	...	...	...	1	...	11	5	6	...
Augusta	...	...	...	...	...	...	1	1	...	2	1	...	2	1	...	...	...	...	...	1	...	9	5	4	...
Savannah	...	...	...	...	...	...	1	1	...	2	2	...	1	2	...	...	...	...	...	1	...	10	4	6	...
Jacksonville	...	...	...	...	...	...	...	...	...	1	1	1	1	3	...	...	...	...	...	...	...	6	2	4	1
Atlanta	...	...	...	1	...	...	1	...	...	1	2	...	1	2	...	1	...	...	...	...	...	9	5	4	...
Mobile	...	...	...	...	...	1	...	...	...	1	...	...	2	2	...	...	...	...	...	...	...	5	3	2	1
Montgomery	...	...	...	...	...	1	...	2	...	1	2	...	2	2	...	1	...	...	...	...	...	10	4	6	1
Vicksburg	...	...	...	1	...	...	1	...	...	3	1	...	1	3	...	...	...	...	...	...	...	10	6	4	...
New Orleans	...	...	...	...	...	...	...	1	...	...	1	...	1	3	...	...	...	...	...	...	...	6	1	5	...
Shreveport	...	2	...	...	...	...	1	...	...	3	1	...	1	2	1	...	...	...	...	...	...	10	5	5	1
Fort Smith	...	3	...	1	...	...	2	...	...	3	2	...	3	...	1	1	...	...	...	1	...	16	10	6	1
Little Rock	...	3	...	1	...	...	1	2	...	3	3	...	2	1	...	2	...	...	...	1	...	19	9	10	...
Palestine	...	2	...	...	1	...	...	...	1	2	1	...	1	2	1	...	...	...	...	...	...	9	3	6	2
Galveston	...	1	...	...	...	...	...	...	...	2	1	...	1	4	...	...	...	...	...	...	...	9	3	6	...
Abilene	...	1	...	...	...	1	...	...	...	...	1	...	2	1	1	...	...	...	...	...	...	5	2	3	2
Corpus Christi	...	...	...	...	...	...	...	...	...	2	1	...	...	5	...	...	...	...	...	...	...	8	2	6	...
Lexington	1	2	...	1	1	...	2	2	...	4	2	...	4	1	...	1	2	...	1	1	...	25	14	11	...
Louisville	1	2	...	1	1	...	2	2	...	4	2	...	4	1	...	1	2	...	1	1	...	25	14	11	...
Memphis	1	2	...	1	...	...	1	3	...	3	3	...	3	2	...	1	1	...	...	1	...	22	10	12	...
Nashville	2	1	...	1	...	...	3	1	...	2	3	...	3	2	...	1	1	...	1	...	...	21	13	8	...
Oxford	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2	...
Chattanooga	...	2	...	...	...	...	1	1	...	...	3	...	3	2	...	1	...	...	1	...	...	14	6	8	...
Knoxville	1	1	...	1	...	...	1	2	...	1	2	...	3	2	...	1	...	...	1	...	...	16	9	7	...
Indianapolis	...	2	...	1	1	...	2	2	...	4	2	...	4	...	...	...	2	...	2	...	...	22	13	9	...
Cincinnati	1	1	...	1	1	...	2	2	...	3	3	...	4	1	...	1	2	...	2	...	...	24	14	10	...
Columbus	1	1	...	1	1	...	1	2	...	3	2	...	5	...	...	1	2	...	3	...	...	23	15	8	...
Parkersburgh	1	...	...	2	...	1	2	...	...	3	1	...	4	1	...	...	2	...	1	1	...	18	13	5	1
Pittsburgh	1	...	...	1	1	1	3	1	...	3	1	...	3	2	...	1	1	...	1	2	1	21	13	8	2
Oswego	...	...	...	1	1	...	2	1	...	2	3	...	1	2	...	...	...	...	...	1	1	14	6	8	1
Rochester	...	...	...	2	...	...	3	...	...	3	3	...	3	1	...	...	1	...	...	1	1	17	11	6	1
Buffalo	...	...	...	1	1	...	3	...	...	2	3	1	2	3	...	1	...	...	1	...	...	17	10	7	1
Erie	...	1	...	2	...	...	2	2	...	4	1	...	3	2	...	1	...	1	2	...	1	20	14	6	2
Cleveland	1	1	...	1	1	...	2	2	...	4	2	...	4	1	...	1	1	1	3	...	1	24	16	8	2
Sandusky	1	1	...	1	1	...	3	1	...	4	1	...	5	...	...	1	2	1	2	...	...	23	17	6	1
Toledo	1	1	...	1	1	...	3	1	...	4	2	...	5	...	...	...	1	1	1	1	...	22	15	7	1
Detroit	...	2	...	1	1	...	2	2	...	4	2	...	4	1	...	...	...	...	1	1	...	21	12	9	...
Port Huron	...	1	...	2	...	...	2	1	...	2	4	...	4	1	...	...	...	...	1	...	...	18	11	7	...
Alpena	...	1	...	1	1	...	2	3	...	3	1	...	2	2	...	...	1	...	...	...	...	17	8	9	...
St. Marie	...	...	...	...	1	...	3	2	...	3	...	...	2	...	...	...	...	...	...	...	...	11	8	3	...
Marquette	...	...	...	2	...	...	3	3	...	2	1	...	1	2	...	...	...	1	...	...	...	14	8	6	1
Green Bay	...	...	...	1	1	...	...	4	...	2	2	...	3	1	1	1	1	...	...	...	...	16	7	9	1
Lansing	1	1	...	2	...	...	1	3	...	3	1	...	2	3	...	...	...	...	...	...	...	17	9	8	...
Manistee	...	...	...	...	1	...	2	3	...	2	4	...	2	4	...	...	1	...	...	...	...	19	6	13	...
Grand Haven	1	1	...	...	...	...	1	2	...	2	3	...	2	4	...	...	2	...	...	...	...	18	6	12	...
Milwaukee	...	1	...	2	...	...	...	4	...	3	3	...	4	2	...	1	2	...	...	...	...	22	10	12	...
Chicago	...	1	...	2	...	...	2	2	...	3	3	...	4	2	...	1	2	...	...	...	...	22	12	10	...
Duluth	...	1	...	1	...	...	3	2	...	3	1	1	3	...	...	1	...	1	...	...	...	15	11	4	2
St. Paul	...	1	1	1	1	...	3	3	...	4	1	...	3	...	...	1	...	...	...	1	...	19	12	7	1
La Crosse	...	1	1	...	1	...	3	2	...	2	2	...	3	...	...	2	1	...	...	1	...	18	10	8	1
Dubuque	...	1	1	1	2	...	2	1	...	3	2	1	3	...	...	1	2	...	1	...	...	19	11	8	2
Davenport	...	2	1	...	2	...	1	2	...	5	1	...	3	...	...	1	2	...	1	...	...	20	11	9	1
Des Moines	...	2	...	1	...	...	3	...	...	3	1	...	3	2	...	1	2	...	1	...	...	19	12	7	...
Keokuk	1	1	...	2	1	...	2	2	...	4	1	...	3	2	...	2	2	...	1	...	...	24	15	9	...
Springfield, Ill	...	2	...	2	...	...	2	2	...	3	3	...	3	1	...	...	...	...	2	...	...	20	12	8	...

Stations.	Oct. 1888.			Nov. 1888.			Dec. 1888.			Jan. 1889.			Feb. 1889.			Mar. 1889.			Apr. 1889.			Total, seven months.			
	Verified signals.	Not verified.	Cold waves without signals.	Verified signals.	Not verified.	Cold waves without signals.	Verified signals.	Not verified.	Cold waves without signals.	Verified signals.	Not verified.	Cold waves without signals.	Verified signals.	Not verified.	Cold waves without signals.	Verified signals.	Not verified.	Cold waves without signals.	Verified signals.	Not verified.	Cold waves without signals.	Total signals.	Verified signals.	Not verified.	Cold waves without signals.
Cairo	...	2	......	1	...	......	2	2	......	3	3	......	3	1	......	...	1	......	1	1	......	20	10	10	......
St. Louis	...	2	......	2	..	......	2	1	1	3	2	......	3	2	......	1	1	1	1	1	......	21	12	9	2
Springfield, Mo	...	2	......	3	...	......	1	1	1	2	1	......	3	2	1	1	2	1	1	...	......	19	11	8	3
Lamar	...	2	......	2	1	......	...	1	1	...	...	......	...	...	......	...	...	......	...	...	......	6	2	4	1
Kansas City	...	2	......	1	1	......	1	1	......	1	4	......	3	1	......	...	2	1	1	...	......	18	7	11	1
Wichita	1	1	......	2	1	......	2	1	......	1	3	......	2	1	......	1	1	1	1	...	......	18	10	8	1
Leavenworth	1	1	......	1	2	......	1	1	......	2	3	......	3	1	......	...	2	1	1	...	......	19	9	10	1
Topeka	1	1	......	1	2	......	2	...	......	1	...	......	...	1	......	...	...	......	...	...	......	9	5	4	.....
Concordia	1	1	......	1	1	......	1	...	1	2	2	1	2	2	......	1	1	1	1	...	......	16	9	7	3
Omaha	2	...	......	1	2	......	2	...	1	3	2	1	3	...	......	2	1	......	1	...	......	19	14	5	2
Yankton	...	1	......	1	...	1	2	3	......	3	...	1	3	...	......	2	...	......	1	...	......	16	12	4	2
Valentine	2	...	....	1	...	......	1	3	1	2	1	......	3	...	......	2	...	......	1	...	......	16	12	4	1
Huron	...	1	1	1	...	1	3	4	......	3	...	3	3	...	......	1	...	......	...	1	......	17	11	6	5
Ft. Sully	...	1	1	1	...	......	4	3	1	2	...	1	3	...	......	1	...	......	...	1	......	16	11	5	3
Moorhead	...	...	2	1	...	......	2	3	1	2	...	4	1	...	3	1	...	......	...	1	......	11	7	4	10
St. Vincent	...	...	1	1	...	......	1	1	1	1	...	2	1	...	2	1	...	......	1	...	......	7	6	1	6
Totten	...	...	1	1	...	......	2	2	1	...	...	1	...	...	......	...	...	......	...	...	......	5	3	2	3
Bismarck	...	1	1	1	...	......	3	2	......	1	...	2	1	...	2	1	...	1	1	...	......	11	8	3	6
Ft. Buford	...	...	......	1	...	......	...	3	1	1	...	1	...	...	2	...	1	......	...	...	......	6	2	4	4
Ft. Custer	...	...	......	...	...	......	...	...	......	...	...	......	...	...	......	...	...	......	...	...	......	...	...	...	......
Rapid City	...	1	1	1	...	......	2	3	......	1	...	2	1	...	1	1	...	1	1	...	......	11	7	4	5
Cheyenne	1	...	......	1	..	......	...	1	......	1	1	......	2	...	......	...	...	1	...	...	...	7	5	2	1
North Platte	2	...	......	1	...	......	...	1	......	...	1	1	3	...	......	1	1	1	...	1	......	11	7	4	2
Cute	1	1	......	2	...	......	1	1	1	...	...	......	...	...	......	...	...	......	...	...	......	6	4	2	1
Denver	1	...	......	1	...	......	...	2	......	3	...	......	...	...	......	...	...	......	...	...	......	7	5	2	......
Montrose	...	...	......	...	...	......	...	...	......	...	...	......	1	...	......	...	...	......	...	...	......	1	1	...	......
Pueblo	1	...	......	...	1	......	...	...	......	...	2	......	3	...	......	...	...	......	...	...	......	7	4	3	......
Dodge City	1	1	......	1	1	......	1	...	......	1	1	......	2	1	1	1	1	......	1	...	......	13	8	5	1

The table shows that the failures of the cold-wave signals are much too frequent.

Failures are more frequent in the northwestern country than elsewhere. This is the section in which the cold waves originate.

The occurrence of a severe cold wave in any part of the country east of the Mississippi without warning, it will be seen, is comparatively rare. In January there were only three cases east of the Mississippi River—one each at Jacksonville, Duluth, and Buffalo; in February there were only three—one each at New London, New Haven, and Green Bay.

The table can be briefly summed up thus: When a cold-wave warning is given, the chances are six to ten that a cold wave will prevail. Of all the severe cold waves that occur the chances are that only one in eight will be without warning. East of the Mississippi River the chances are only one in seventeen.

An examination of this table suggests the advisability of making some changes.

As the failures are so frequent in the Northwest it would probably be well to change the limit of temperature fall for cold-wave warnings.

A country so subject to great temperature changes does not require to be informed of every twenty-degree fall. At Bismarck, for instance, a twenty-degree fall of temperature in twenty-four hours or less may be expected to occur ten or twelve times in the course of a single winter month. To give a considerable proportion of successful warnings in such a month would require the cold-wave flags to be flying at least half the time. Under such circumstances the cold-wave flag loses its significance to the people and ceases to be regarded.

A temperature fall of twenty-six degrees in twenty-four hours, going to thirty-two degrees or lower, would be a suitable limit for Dakota and Minnesota. The present limiting temperature of forty degrees seems certainly too high for that country to justify a cold-wave signal in winter time. With a temperature of forty degrees at 6 a. m., local time, it is apt to be ten to fifteen degrees warmer in the middle of the day, a temperature that is balmy for the climate at that season of the year.

It would probably be well to change the limiting temperature of the cold-wave warning for the rest of the country to thirty-six degrees, except for Virginia, North and South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas. For these latter States the retention of the present limiting temperature, forty degrees, is desirable.

At certain places the display of cold-wave signals might be discontinued; Jacksonville is such a place. They occur there so seldom, and the uncertainty in the forecast is so great as to render the warnings of little service to the community.

There are other places for which the showing is no better than the one just mentioned. But probably better can be done in the future than has been done for those places during the season passed.

The special midday observation which is at times called for from certain stations where it is thought a cold wave is likely to form, has been found to be of the highest utility in forecasting. Such a cold wave as that of December 6 and 7, 1882, would certainly be missed at three-fourths of the places without a midday special.

MANNER IN WHICH COLD WAVES OCCUR.

Previous to beginning the forecasting of cold waves time was devoted to the investigation of the circumstances attending their development and progress as shown by the maps of the forecast division for previous years.

An examination of the weather map shows very plainly that the cold is associated very closely with areas of low barometer. They usually occur to the west and northwest of a low area, and follow after it as the center moves southeast, east, or northeast. In fact, following after every low area there is a fall in temperature, usually amounting, however, only to twelve or fourteen degrees, but in autumn and winter reaching very often as much as twenty degrees, especially if the low area is of very wide extent. These, however, are not the severest kinds of cold waves. Their effects last but a short time, the low temperature lasting but five or six hours. The severe cold waves are associated with extensive areas of very high barometric pressure that first make their appearance in Dakota and Montana and the region to the north. These high areas sometimes come alone without much of a preceding accompanying barometric depression. Under such circumstances, however, usually, though not always, the progress of the cold wave is comparatively slow, its front never moving forward more than 300 miles in a southeasterly direction in twenty-four hours.

When the cold wave of a high area of barometer comes into close proximity with an extensive and well-defined area of low barometer the progress of the front of the cold wave is extremely rapid and the area of temperature fall of twenty degrees and over is very large. It sometimes occurs with cold waves of this kind that the front of the wave will advance from a line through St. Paul and North Platte, Nebr., for instance, to a line from Pittsburgh, Pa., to Vicksburg, Miss., or on an average 800 miles in twenty-four hours. The area of country with a twenty-degree fall of temperature will be half a million square miles. The area over which the fall is ten degrees and more will be a million five hundred thousand square miles.

These cases of the fortuitous coincidence of a high area of barometer and a very extensive low area occur infrequently. The rapid and extensive progress of the cold wave in this case is mainly transmission or actual motion of cold air from the colder to the warmer parts of the country through the agency of the typical winds of the low area of barometer, which on its western side blow from the northwest and west.

The propagation of a cold wave from a high area of barometer alone is not an actual movement of the air from the northwest to the southeast, except at the very front of the cold wave.

The cold wave that comes from a low area of barometer alone is probably very largely air moved from a colder to a warmer place. This is evident from the fact that the extent of the temperature fall and the area the fall covers depend so much on the temperature gradient towards the northwest of the low.

Nothing can be definitely known as to where a low area of barometer will appear. It may put in an appearance anywhere. Probably by far the greater number first appear to the northwest of Lake Superior. After traveling southeast to the lower lake region, they turn northeast and move to the Gulf of St. Lawrence. Sometimes they develop in Colorado and move straight east or southeast. Sometimes they first appear in Texas or the Gulf of Mexico and travel a little east of north or northeast. Again they appear off the Atlantic coast in the vicinity of Florida, and travel up the coast or a little inland. These latter lows very rarely are associated with sufficient fall of temperature to be considered cold waves.

Sometimes, however, when the low areas are of considerable extent they will produce just enough fall of temperature to justify the display of a cold-wave signal in the northern parts of their courses in New England. The low areas usually pursue a tolerably definite path after they have once started to move. This is more especially so in the winter months. Their motion seems to depend a good deal on the precipitation around them, especially that to the east of them. As soon as the rain begins to fall they begin to move. After the center of the low can be definitely indicated at two successive observations it will usually be found twelve hours later in the straight line prolongation of the path as shown by the two observations. The velocity of the low center varies in different parts of its path. Its motion is usually accelerated as it goes on, but for one twelve hours as compared with the succeeding twelve hours the motion may usually be considered as uniform in trying to estimate its position twelve hours ahead.

The acceleration in the motion of the low area is more usual when it travels from the south in a northerly or northeasterly direction than at other times.

When a low area is about to make a decided change in the direction of the path of its motion it moves very slowly, and, in fact, sometimes remains almost motionless for two or three days. This is especially marked in the case of the West India cyclone when it moves in from the Atlantic Ocean towards the northwest and then changes its direction towards the northeast.

Among the auxiliary maps of the forecast division is one giving the twelve and twenty-four hour changes of barometer in blue and red lines. The areas of great barometer fall 0.2, 0.3, and 0.4 of an inch in twelve hours, as shown on these maps, bear a close relation to the center of the low area of barometer and its motion. The center of the area of greatest fall of the barometer in twelve hours is frequently at the center of the low area. When the low-area center is not at the center of the area of greatest twelve-hour fall it is likely to travel towards the center of the area of greatest twelve-hour fall.

The low areas that first appear in the far northwest near Lake Superior have the areas of barometer fall that are associated with them, presumably usually of an oblong shape with the long axis extending north and south. The lower or southern halves of the areas only are visible on the change maps owing to absence of observations over the upper or northern portions of the areas.

A good rule for locating the future twelve-hour position of this species of a low is to place it at the intersection with the line indicating the 0.2 of an inch fall in the barometer in twelve hours and a line from the center of the low area perpendicular to the long axis of the 0.2 of an inch area of twelve-hour fall in the barometer and on the side of the 0.2 fall area farthest from the center of the low.

The high area of barometer associated with a cold wave puts in its first appearance in the country from Lake Winnipeg in Manitoba towards the west. Of enormous extent it spreads rather than moves southeast or east. Its extension is very vague and uncertain, as compared with the motion of a low area. It is more apt to extend southeast than east.

The farther east a high area is, the more important is the part it plays in the production or transmission of cold waves. Some of the high areas that center about Helena, Mont., and that vicinity in the winter time seem to have little or nothing to do with the production of cold waves. The temperature in the center of these high areas is low and possibly the greater height of barometer is, in some part at least, owing to the magnitude of the reduction for height of the barometer above sea-level. This reduction increases as the temperature diminishes.

The shape and the extent of a low area of barometer and its position with respect to a high area has great significance as regards the propagation of its associated cold wave.

The case of an elongated area of low barometer with the long axis extending from southwest to northeast is especially favorable for the coming down of severe and prolonged cold waves on the eastern and middle parts of the United States. The meaning of this may be that there is more of a high area to the north of a low area of this kind, not visible from lack of observations, which is nearer to the country over which a cold wave is about to prevail and that consequently there is a greater area of cold air from which to draw.

It would be possible to make a useful classification of the different kinds of cold waves that may prevail over the different parts of the country, based on the different sections of the country in which the low area of barometer originates, whether accompanied or not by a high area of barometer, and the different relative positions of the high and low areas and their absolute extent. For the practical work of giving warnings, this, it is thought, would be of great advantage. Before beginning the cold-wave warnings of the past season, the back maps of other years were thoroughly studied, beginning with the year 1881.

Small sketch-maps of a size 3 by 4 inches were made of the principal cold waves that occurred in eight years during December and January, giving the main features of the isobars and isotherms and the lines showing areas of 20, 30, and 40, etc., degree falls in temperature. These were used to compare with the maps from day to day in forecasting the occurrence of cold waves, and were found to be of some service. It was supposed that by having the maps of a great number of the different kinds of cold waves occurring in many years it might be possible to select some one from among them which would be nearly identical with the maps from which the cold waves were being forecast from day to day. When such a case was found, then the originals of the back maps could be consulted and used as a basis in the forecasting. This scheme was not as successful as it was thought it might be.

The most valuable adjunct in forecasting cold waves was found to be the map showing the twenty-four hour temperature changes. It is almost a certainty that when this map shows a considerable area of temperature fall, say twenty degrees, that the next day there will also be a considerable area of fall farther on to the east, southeast, or south of it. When this area is very large, constituting the severe and extensive cold wave, the forecasts to the east and south of it are almost certain, and only a very few signals on the borders of the areas fail of verification. It is when the twenty-degree fall areas are small, 20,000 square miles or thereabout, that the largest proportion of the cold-wave forecasts based upon them farther east are unsuccessful. It is the case of the cold waves of small extent that must be provided for in order to dimish the present large number of warnings where cold waves do not occur. A cold wave with a temperature fall of twenty degrees over only 20,000 square miles is an insignificant affair. The minimum number of stations with twenty-degree falls to be considered a severe cold wave should not be less than four-covering at least 20,000 square miles.

There are three very characteristic regions in or about the vicinity of a low area of barometer where the greatest falls of temperature occur as the low area moves off.

The first is the center of the low area which is usually inside of the area of subsequent greatest temperature fall.

The second is the summit or most northern point of one or more of the isothermal lines which cross the low area in the vicinity of its center. These lines usually extend from the southwest towards the northeast until they reach the vicinity of the low center, when they change their direction, running sometimes almost directly from north to south, forming a loop. These summits are sure to be in the area of the subsequent greatest temperature change.

The third region is the region to the southwest, west, northwest, and north of the low area, over which there is a very marked diminution of temperature to the west, northwest, and north; or region of great temperature gradient.

This last is a feature of the greatest importance in a prospective cold wave. On it depend the extent of the temperature-change area and the magnitude of the greatest temperature falls. It will sometimes be a region with a front in a southwest-northeast direction of 1,000 miles in length, and a depth in a northwesterly direction of 500 miles, and with a uniform diminution in temperature in the latter distance of sixty degrees. Such an area to the west of a considerable area of low barometer is sure to cause a great cold wave to the east of it.

Such, briefly, are some of the more important characteristics attending the progress of cold waves. It is by attention to these and a consideration of the winds of high velocity occurring to the northwest of the low center or on the southeast front of a high area of barometer that the attempt is made to forecast the occurrence of cold waves.

The judgments are made from the map solely with the eye. An estimate is made in the mind of the relative importance of the various factors that go to the production of a cold wave, such as the greater or less extent of the low and high area of barometer on which it depends and their relative positions, the area of great temperature fall that has already taken place, the extent of country covered by high-temperature gradient where the isothermal lines are crowded close together, the velocity of the wind, the extent of the area of cloudiness, and the actual or prospective precipitation. The judgment is in no way assisted by any arithmetical computations, with one exception. It depends entirely on estimates of the relative areas and forces made with the eye. The exception referred to is the case where a very extensive cold wave is coming and the direction of motion of its front line being pretty well known, an estimate is made of the minimum temperatures that will occur to the east of it by taking them to be just as much below the normal temperature at the place for that time as the minimum temperature is below its normal at some place over which the cold wave has already passed.

There is of course no time for the application of any complicated system of computation for the purpose of forecasting the motion of a cold wave. The wave might come and go before the computation could be made. But the judgment ought if possible to be assisted by some simple device of calculation. Otherwise there is not much likelihood of there soon being any very considerable improvement in the quality of the cold-wave warnings.

The method by which I would propose to assist the judgment in the forecasting of cold waves is by measurements of the various areas concerned in their production with a planimeter. It affords a ready and simple means for that purpose. Measurements would first have to be made of the areas of low barometer and high barometer, temperature-fall areas, and regions of high-temperature gradient, pertaining to a great many cold waves for past years. When this was done a study of their relative significance and interrelation might be made and some rules devised for determining the areas of temperature falls in future cold waves and their relations with respect to the lows, etc.

There needs to be prepared tables showing the relation of the minimum to the normal temperature in various parts of the same species of cold waves that have occurred over the country in previous years. This is for the purpose of improving the numerical rule previously referred to for finding the lowest temperature in the cold wave. The fall below the normal is not as great in the East as it is in the West—a circumstance which points to the fact that the cold wave in the East is mainly or largely a progression of cold air from the west and north. A given area of forty degrees fall in the West gives a somewhat larger area of thirty degrees fall farther east, etc.

This method will be simple and practicable. It will not be a departure in principle from the method of forcasting as practiced now. It will be merely having an instrument take the place of the eye in estimating areas. Numerical expressions for temperature gradients will be used instead of vague general impressions, as now.

CAUSE OF COLD WAVES.

The beginning of a cold wave is in my opinion the result of an adjustment of the temperature in the different strata of the air from the surface of the ground up to a great height consequent on a more than ordinary diminution of the temperature with altitude. This applies chiefly to the first stage of a cold wave where the cooling of the air at the earth's surface is associated with an area of high barometer. When this goes on within a suitable distance of a center of low barometer, the cold wave is then mostly the result of a transfer of cold area from one place to another through the agency of the winds blowing from the northwest.

On the edge of a high area, even when not accompanied by a low, some part of the cold wave is caused by a transfer of cold area along near the ground.

There is generally a diminution of temperature upward in the air. The amount of diminution varies with the season. On the average it is 1 degree for every 300 feet of altitude. For the average of all the days in winter it is a very little less than in other seasons. There are times in the winter when it is very much greater than at other times. In winter time observations on the summit and at the base of mountains, when a high area of barometer is prevailing, show the air above is some times decidedly warmer than that below. This being the case, and on the average there being, nevertheless, a great diminution of temperature upward makes it certain that there must be times in the winter when the diminution upwards is greatly in excess of what it is at other seasons.

The causes that favor a diminution of temperature upward are more active in winter than in other seasons. The nights are very much longer. There is a greater amount of radiation into space from the upper strata of the atmosphere. There is also a greater radiation from the lower strata. But that from the upper strata is proportionately larger. During the day in winter there is a greater relative absorption of heat from the sun's rays in the lower strata of the atmosphere than in the upper. This is due to the almost entire absence of moisture in the upper strata of the air in winter time and possibly also to the absence of dust particles.

About one-third of all the heat the air receives from the sun is absorbed as its radiations pass through the air. The rest gets into the air by the earth first becoming heated and the air then taking it by contact from the earth. The air in contact with the earth is soon heated and rises rapidly a few feet. Its place is taken by other cooler air from above. This heating of the lower strata of air by convection is very active for a few feet above the earth. There is more or less convective action even to a very considerable height in the air.

If a great mass of air in which there is a considerable diminution of temperature upward is set in motion horizontally near the earth's surface from any cause whatever, as, for instance, by indraught from a neighboring low area of barometer, or by the piling up on its upper surface of the overflowing air from neighboring lows, then as the air moves it will become thoroughly mixed throughout all its strata by its tumbling and rolling over and over as it moves along. The tendency of this is for the air to become of a uniform temperature. If the air becomes uniform in temperature, then the temperature of the layers near the surface of the earth must be lowered, while those above are made higher.

This action is conceived to be something like what would take place in a vessel of water with the top layers warm and the lower layers cool. If thoroughly stirred up with a paddle it becomes of a uniform temperature.

Taking Hann's formula, expressed in degrees, centigrade and heights in meters, $t = T - 0.0062218\,h + 0.0000002737\,h^2$ for the diminution of the temperature, with the altitude, and taking the temperature of the air at the earth's surface as 50° Fah., considering the air to be thoroughly agitated throughout a depth of eight miles and the temperature to become uniform, it would all attain a temperature of 14°.5 Fah., or a fall of 35°.5 at the earth's surface. To produce a fall of only twenty degrees would require an agitation of the air through a relatively much less altitude than eight miles. This applies for perfectly dry air. With moisture in the air the fall in temperature would be less, as the latent heat given up in the condensation of the moisture that would necessarily ensue on the thorough mixing of the air would raise the temperature somewhat.

The air being thus uniform in temperature throughout, and no heat being added or subtracted, there is no change in the pressure of the air at the ground. But the upper layers being warmer than before there is greatly increased radiation from the upper layers into space The upper layers very quickly regain their accustomed temperature peculiar to the particular season of the year in which this occurs. As the upper layers of air contract in cooling there is a depression caused in the free surface of the atmosphere at its upper limit and an instantaneous rush of the air takes place from surrounding places to fill it. This instantly causes an increase of pressure at the surface of the earth and all along the column of air.

It will be seen that this explains the increase of barometric pressure accompanying a cold wave to be the result of the cold. The two things in fact are very nearly simultaneous. After an area of cold and high pressure has developed in this way, the equilibrium of pressure with surrounding regions is restored by the air flowing along the ground from places of high to places of low pressure. Here the progress of the cold wave is preceded by the high pressure of which it is the result.

Whether the cold is simultaneous with the high pressure or whether the high pressure appears a little before the fall in temperature is a very important criterion in judging of the progress of cold waves on their first appearance in the Northwest. A great many areas of high pressure come forward in the Northwest before the fall in temperature. This is the only kind for which it is possible to make successful forecasts of cold waves in Dakota and that vicinity. They progress only a little distance and are not the severest species of cold waves that occur there. They are probably the ends of the severer variety of cold waves which occur farther to the north where we have no observations.

The other variety that forms and develops with the fall in temperature and increase of pressure simultaneously occur over a large extent of country before a warning can be given to the greater part of the area affected.

This is somewhat opposed to the accepted theories in regard to convection currents in the air. When the air ascends it is dynamically cooled and when it descends it is warmed. There is no tendency to an interchange between the air of the upper and lower strata until the rate of diminution of temperature with ascent is greater than one degree Fahrenheit for each 182 feet. When this limit is exceeded convection currents are set up which, mixing the air above and below, tend to bring it to a uniform temperature, and consequently lower the temperature at the surface of the earth unless heat is added there faster than it is being carried away by convection.

When the sun is shining during the day heat is ordinarily being added to the lower layers of the air faster than it is being carried away by convection and the temperature rises in the course of the day. But if the convection currents extended to a very great height, consequent on a more than ordinary diminution of temperature upward, the temperature at the surface might fall.

Ordinarily the temperature diminution in the air upward, starting from a height 2,000 or 3,000 feet above the earth's surface and taking in a considerable thickness above that, is less than that of the rate for dynamic equilibrium.

It has been maintained that air coming from above is heated dynamically by its compression in descending, and that which ascends is cooled dynamically by the ascent, and that consequently when the rate of diminution of temperature upward is less than that for dynamic equilibrium, air coming from above when it reaches the earth's surface will be warmer than the air at the surface. Under certain conditions this would be so. If air under such circumstances was brought from a height down to the surface of the earth in a rubber bag it would undoubtedly be increased in temperature and be higher than that at the surface. But this is not analogous to what takes place in nature. In most instances every volume of air that comes from above is mixed with an innumerable number of other volumes of air during its descent.

The intimate mixture of the air in ascending and descending makes a vast difference in the final distribution of the temperature. If all the air that came from above came down through tubes so it could not mix through the other air, and all that went up went through another set of tubes, the air below might become warmer and that above colder. If the air came from above in a current and the equilibrium was restored by an equal upward current in some distant place there might under these circumstances be an increase in the surface temperature. This it is imagined is what takes place in the Foehn and Chinook winds where a current of air comes down from a mountain simply displacing the air in the lower strata, and not mixing with it. The excess of heat of the Foehn is the latent heat of the moisture condensed by the ascent of the air on the other side of the mountain.

The result as to temperature in the air at the surface of the earth is entirely different when through the agency of convection currents the air is thoroughly mixed throughout a great depth. When the upward temperature diminution over a wide area becomes considerably in excess of what corresponds to dynamic equilibrium, that is, greater than it and sufficiently in excess of it to overcome the viscosity of the air, then there is an intimate mixture of the air in the ascending and descending currents. The result is that the air becomes nearly of a uniform temperature throughout, especially if the agitation is assisted by heavy winds. The air is consequently lowered in temperature at the earth's surface.

This, it is confidently believed, is the explanation of the cause of a cold wave in its origin. A circumstance that bears this out very strongly is that there is a marked tendency for the cold waves in the Northwest to start in the afternoon just at the time of day when the maximum temperature occurs, and when the upward diminution of temperature is at its greatest. Something analogous takes place in every thunder-storm where there is a fall of about fourteen degrees in temperature occurring in the middle of the day. The air to produce the fall must come from above. There is no cold air at the surface of the earth round about which could produce it. These falls of temperature are rapidly recovered as the areas are small, and the air is quickly replaced by the warmer air from the surrounding country. A small cold wave occurred the past year in North Carolina at 8 p. m., on February 15. There were falls of eighteen degrees, from fifty-four to thirty-six degrees, at Charlotte and Raleigh, which must have been the result of cold air coming from above, as there was no cold air around it unless it was out on the ocean, which is not very likely. It was not radiation from the ground, as the sky was clouded.

A very large proportion of all the considerable falls in temperature in California, amounting to 15° or more in twenty-four hours, occur between 1 p. m. and 1 p. m. local times. This is very conspicuous on the charts for back years when there were three observations daily, one being made at 3 p. m., seventy-fifth meridian time. The large temperature falls may have been to some extent due to cloudiness occurring at that time of day. But for the most part they must have been due to the cooling of the lower air by air from above through the agency of convection currents.

That this is the cause of cold waves is likely from the fact that there is a sufficient reason for the temperature differences in the upper and lower air being greater in winter than in summer time, namely, greater radiation from the upper air on account of the greater length of the winter nights and greater relative heating of the lower air near the earth by the sun in the daytime on account of the absence of moisture. It explains, moreover, the high barometer. Areas of high barometer occur also to some extent in summer time, but they rarely exceed in the highest part 30.3 inches.

Very respectfully,

T. RUSSELL,
Assistant Professor, Signal Service.

General A. W. GREELY,
Chief Signal Officer, U. S. Army.

APPENDIX 13.

REPORT OF THE ASSISTANT PROFESSOR IN CHARGE OF THE RIVER AND FLOOD DIVISION.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington, July 9, 1889.

SIR: I have the honor to make the following report on the work of the river and flood division of the Signal Office.

This work was given into my charge on the 1st of June. Previous to that time the work pertained to the stations division.

At seventy places scattered throughout the country the heights of rivers are observed daily. These places are grouped in sections. Each place reports the daily heights of water to its section center by mail once a week.

When there are unusual rises in the rivers the gauge readings are telegraphed to the section centers, sometimes several times a day.

A monthly form giving the heights of the river each day is sent in to the Washington office from each station.

At the river stations rain-fall observations are also made.

In addition to the river stations there are forty-five stations where rain-fall alone is observed. These stations also report weekly by mail to section centers. When the rain-fall exceeds an inch in twenty-four hours the amount is telegraphed to the section center. The amount is also telegraphed when the fall is as much as half an inch the day after there has been a fall of 1 inch.

During the year river stations were established at Greensborough, Pa., and Mount Vernon, Ind., July 1, 1888. Arrangements were made to have a river gauge established at Point Pleasant on the Ohio River. When completed, observations will be made there instead of at Gallipolis. Arrangements were made to have a new river gauge erected at Harper's Ferry, W. Va.

Special rain-fall stations were established at Medford, Wis., April 1, 1889, and at Woodstock, Va., Cumberland, Md., and Gettysburgh, Pa., July 1, 1889. The last three are for the purpose of giving flood warnings to Washington City.

River stations were discontinued at the following points: Albany, Oregon, and Eugene City, Oregon, July 1, 1888; Wabasha, Minn., April 1, 1889, and Madison, Ark., May 10, 1889. Rhinelander, Wis., was discontinued as a special rain-fall station March 31, 1889.

The following is a list of river stations and special rain-fall stations to be in operation the coming year:

List of special river stations arranged according to sections.

Head of section.	Name of station.	Head of section.	Name of station.
Cairo, Ill.	Columbia, Tenn.		Oil City, Pa.
	Eddyville, Ky.		Parker's Landing, Pa.
	Evansville, Ind.		Rowlesburgh, W. Va.
	Grand Tower, Ill.		Saltsburgh, Pa.
	Mount Carmel, Ill.		Warren, Pa.
	Mount Vernon, Ind.		Weston, W. Va.
	Paducah, Ky.	St. Louis, Mo.	Beardstown, Ill.
	Johnsonville, Tenn.		Boonville, Mo.
	Vincennes, Ind.		Hermann, Mo.
	Charleston, Tenn.		Jerome, Mo.
	Clinton, Tenn.		Le Claire, Iowa.
	Decatur, Ala.		Louisiana, Mo.
Chattanooga, Tenn.	Kingston, Tenn.		Peoria, Ill.
	Loudon, Tenn.		Warsaw, Ill.
	Strawberry Plains, Tenn.	Shreveport, La.	Coushatta Chute, La.
	Rockwood, Tenn.		Fulton, Ark.
Kansas City, Mo.	Manhattan, Kans.	Memphis, Tenn.	Helena, Ark.
	Plattsmouth, Nebr.	Vicksburg, Miss	Yazoo City, Miss.
	St. Joseph, Mo.		Newport, Ark.
Nashville, Tenn.	Burnside, Ky.		Arkansas City, Ark.
	Carthage, Tenn.	Charleston, S. C.	Mount Holly, N. C.
New Orleans, La.	Alexandria, La.	Little Rock, Ark.	Dardanelle, Ark.
	Delhi, La.	Washington, D. C.	Harper's Ferry, W. Va.
	Girard, La.		Muscatine, Iowa.
	Monroe, La.	Cincinnati, Ohio	Wheeling, W. Va.
	Camden, Ark.		Marietta, Ohio.
	West Melville, La.		Portsmouth, Ohio.
Pittsburgh, Pa.	Brookville, Pa.		Zanesville, Ohio,
	Clarion, Pa.		Gallipolis, Ohio.
	Confluence, Pa.		Circleville, Ohio.
	Freeport, Pa.		Charleston, W. Va.
	Greensborough, Pa.		Hinton, W. Va.
	Lock No. 4, Pa.		Catlettsburgh, Ky.
	Johnstown, Pa.		Louisa, Ky.
	Mahoning Pa.		Falmouth, Ky.
	Morgantown, W. Va.		Frankfort, Ky.

SPECIAL RAIN-FALL STATIONS—ONE OBSERVATION TAKEN DAILY.

Cairo section—Lafayette, Ind.; Terre Haute, Ind.; Logansport, Ind.; Greensburgh, Ky.; Bowling Green, Ky.

Chattanooga section—Rogersville, Tenn.; Murphy, N. C.; Asheville, N. C.; Charleston, N. C.

Cincinnati section—Kenton, Ohio.; Mansfield, Ohio; Wooster, Ohio; Canton, Ohio; Abingdon, Va.; Caledonia, Ohio; Christiansburgh, Va.; White Sulphur Springs, W. Va.; Glenville, W. Va.; Buckhannon, W. Va.

Dubuque section—Portage, Wis.

Fort Smith section—Springer, N. Mex.; Eufaula, Ind. T.; Tulsa, Ind. T.

Keokuk section—Cedar Rapids, Iowa.

La Crosse section—Chippewa Falls, Wis.; Phillips, Wis.; Medford, Wis.

Kansas City section—Culbertson, Nebr.; Oberlin, Kans.; Kirwin, Kans.; Wallace, Kans.; Salina, Kans.

Louisville section—Rushville, Ind.; Huntington, Ind.; Sidney, Ohio.

Nashville section—Williamsburgh, Ky.

St. Louis section—Ottawa, Ill.

St. Paul section—Fergus Falls, Minn.; Fort Ripley, Minn.; Ortonville, Minn.; Alexandria, Minn.; Redwood Falls, Minn.; Tracy, Minn.

Washington section—Woodstock, Va.; Gettysburgh, Pa.; Cumberland, Md.

Telegraphic reports of the stage of the water are received daily at the Washington office from the following places: Shreveport, La.; Fort Smith and Little Rock, Ark.; Sioux City, Iowa; Omaha, Nebr.; Kansas City, Mo.; St. Paul, Minn.; La Crosse, Wis.; Dubuque, Iowa; Davenport, Iowa; Keokuk, Iowa; St. Louis, Mo.; Cairo, Ill.; Memphis, Tenn.; Helena, Ark.; Vicksburg, Miss.; New Orleans, La.; Pittsburgh, Pa.; Parkersburgh, W. Va.; Cincinnati, Ohio; Louisville, Ky.; Chattanooga and Nashville, Tenn.; and Augusta, Ga.

From these, in connection with the rain-fall observations twice a day from Signal

Service meteorological stations, forecasts of a general character are made of the prospective stages of water for various places.

The work of the river and flood division consists in attending to the correspondence relating to appointments of observers, the building, the renewal, and the repair of river-gauges, the answering of inquiries about floods, bench-marks, etc.

The appropriation available for the carrying on of river observations is not sufficient for the maintenance of as many stations as it would undoubtedly be for the benefit of various communities to have established.

It would unquestionably be of great importance to the people along the Alabama River to have observations made on the Coosa and Tallapoosa Rivers, that telegraphic warning of coming floods might be given.

An appeal the past year from the Chamber of Commerce of Montgomery for the establishment of such stations had to be denied for want of money to erect gauges and pay observers.

The State government of South Carolina established the past year a number of river stations throughout the State, which are under the control of its State weather service.

The immediate good to a community of the establishment of river stations is not very great. It requires usually several years' observations in order to determine the relation between flood and heights along various stretches of a river, as floods occur so seldom.

At Washington City, for instance, the only flood approaching that of June 2, 1889, was the one of November 25, 1877. The highest water at Harper's Ferry, W. Va., preceding the June, 1889, flood, was 34.5 feet above low water. This was higher than the high water of 1877 at Harper's Ferry by 6.8 feet. The high water of June, 1889, in Washington City, which reached to the store doors on the north side of Pennsylvania avenue, between Ninth and Tenth streets, was 3.3 feet higher than the high water of November 26, 1877.

There was a high water in Washington in February, 1881, not caused by a freshet but by an ice jam in the Potomac at the Long Bridge, which came within 9 inches of being as high as the high water of 1889.

An investigation has been begun of the relation of the river-gauge readings at the various stations along the Mississippi River and its principal tributaries, with a view to deriving practical rules for forecasting the heights of water.

A study has been made of the rain-fall of the Mississippi Valley for the years 1881 and 1882. The depths of rain-fall were plotted on charts for the months and lines of equal depth of rain-fall were drawn. By means of a planimeter the areas between the lines and the boundaries of the various catchment basins of the different valleys were measured. From these the amount of water falling as rain was computed in cubic miles. This was done for the Missouri Valley in three sections, the Upper Mississippi Valley above St. Louis, the Ohio Valley, and the valley of the Lower Mississippi.

Estimates were made in a similar manner of the possible evaporation in the same valleys, and the amount of water the air would contain if saturated.

The river discharges at various points along the Mississippi and tributaries that have been measured under the direction of the Mississippi River Commission in 1882, have been collated, and the discharges at the points computed in cubic miles for the months of 1881 and 1882.

The results of all these computations are given in the paper herewith, "Rain-fall and River Outflow in the Mississippi Valley."

It is intended the coming year to continue the investigation of the relations of the river-gauge readings and the observed rain-falls in various valleys, with a view to forming an idea what the heights of high water will be and the time it may be expected to prevail along the lower courses of the rivers when the gauge readings at places higher up the rivers are known.

A chart was prepared showing the rain-fall in valleys of the Susquehanna and Potomac Rivers and the valley of the Alleghany and Monongahela Rivers during the great rain-storm of May 30, 31, and June 1, 1889. This is printed in the May number of the Weather Review.

Very respectfully,

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The CHIEF SIGNAL OFFICER.

APPENDIX 14.

RAIN-FALL AND RIVER OUTFLOW IN THE MISSISSIPPI VALLEY.

As a preliminary to the derivation of some rule for predicting the stage of water several days in advance, if possible, at a number of the principal cities along the Ohio, Missouri, and Mississippi Rivers by means of the river-gauge readings further up the rivers, and from the observed rain-falls at various points in the catchment basins of the rivers, some data has been gathered together which it is thought will be useful for that purpose.

There are given here:

(1) The river outflow at various places in cubic miles for the months of 1881 and 1882.

(2) The rain-fall in cubic miles in the six great valleys of the Mississippi, for the months of 1881 and 1882, and also the normal rain-fall as derived from curves based on the eighteen years observations, 1871 to 1888 inclusive.

(3) The fictitious, or possible evaporation in cubic miles of water in the six great valleys, for the months of July, 1887, to July, 1888.

(4) The average amount of water in cubic miles in the air, as vapor, in the six great valleys during the months of July, 1887, to July, 1888. And also the amount required to saturate the air in the same valleys.

(5) The monthly mean-gauge readings at various places along the Ohio, Missouri, and Mississippi Rivers, for 1881 and 1882.

(6) The monthly mean velocities of the water in miles per hour at various places along the Mississippi, Missouri, and Ohio Rivers. The velocities are the averages throughout the whole cross-sections of the rivers.

(7) A discussion of the relation between the river outflow and the rain-fall for each valley, and of the relation between the actual quantity of water evaporated and the fictitious or possible evaporation.

RIVER OUTFLOW.

The outflow of rivers at various points in the Mississippi Valley, given in Tables I, II, and III, in cubic miles of water, is derived from data given in reports of the Mississippi and Missouri River Commissions.

The outflows are principally derived from the results of meter measurements of current velocity. Gauge readings were taken at the time of measurement. The gauge reading indicates the height of the surface of the river above an arbitrary zero. In many instances where meter measurements are lacking the outflows are computed from the gauge readings.

In the commission reports the river outflow is usually given daily in cubic feet per second. The quantities given in the tables are derived from these by multiplying by the number of seconds in a day, adding all the days in the month, and then reducing to cubic miles.

The measurements of current velocity were made with a meter immersed in the river. The meter consists of a screw wheel revolved by the current. The revolutions are recorded electrically on a chronograph on shore. The method of gauging the outflow of rivers was usually to measure the velocity of the current at points 100 feet apart on a selected cross-section of the river.

The meter was anchored at a depth below the surface ot the river equal to sixty-two one-hundredths of the depth of the river at that point. Experiment has shown that the velocity at this depth is the mean of all the velocities, from the surface to the bottom of the river. At each point the velocity was measured for an interval of five minutes.

From a series of measurements of this kind made each day, and a knowledge of the cross-section of the river, and the constants of the instrument, the engineers calculated the outflow in cubic feet per second, which are given in their reports.

The results for the outflow of rivers derived from such measurements are of a high order of accuracy. It is estimated that the results by this method in any case are not in error by as much as 5 per cent. of the amount of the outflow. There has been a care and elaboration bestowed on the gaugings made at the various places along the Mississippi River never before equaled in work of that kind.

In a few instances the current velocities of the rivers have been obtained by means of floats, where, on account of difficulty of anchoring boats, from running ice, or for other reasons, the meter method was impracticable.

By the float method the times were noted of the transit of the float by the wires of theodolites set up over the ends of a base-line measured on shore.

Column 5 of Tables I and II contains the outflows of rivers for the months of 1881 and 1882 at Omaha, derived from the gauge readings of the Missouri River, given on pages 294 and 295 of the Report of the Missouri River Commission for 1886, in connection with the gauge readings and discharge measurements made in 1878, 1879, 1880, and 1882, given in Commission Report for 1887, on page 3089. The outflow at Omaha for April, 1881, 4 cubic miles, is very doubtful. It is the result of an extrapolation. The mean gauge reading for the month of April was 564.6 feet. (Engineer gauge.)

The highest gauge reading when any discharge observations were made was 557.7 on July 12, 1882. In fact all the outflows for the Missouri River for 1881 and 1882 are open to question at Omaha, as the method of determining it by gauge reading at that point is not satisfactory.

Column 6 of Table II contains the overflow of the Missouri River for 1882, at St. Charles, near the mouth of the river, derived from the gauge readings in connection with the discharge observations in 1879, given in the Missouri River Commission Reports for 1886 and 1887.

Column 6 of Table I, March to September inclusive, are the outflows derived from the differences of the gaugings of the Mississippi River for the same months at St. Louis and at Grafton, just below the mouth of the Illinois River. The quantities for the other months are derived from the gauge readings. The outflow for the months of March to September was also computed from the gauge readings to ascertain how well it might agree with the outflow as derived from the differences of the two gaugings. The results were as follows:

Outflow of Missouri River in cubic miles.

Month.	From river-gauge readings.	From differences of meter measurements.
March	2.58	3.14
April	4.52	4.65
May	3.86	4.70
June	2.68	3.13
July	2.36	2.72
August	0.98	1.04
September	0.67	0.82

The results from the differences are adopted as being the more trustworthy.

Column 2 of Table III contains the outflow of the Missouri River at St. Charles, for 1879, derived from discharge measurements made on seven days in February, sixteen days in March, thirteen in April, twenty-two in May, eighteen in June, twenty-three in July, twenty-three in August, twenty-five in September, and twenty-three in October. On days when there were no discharge measurements the outflow was taken to be the same as the average of the days in the same month when there were observations, and the months filled out accordingly. The outflow for January, February, November, and December was derived from the gauge readings.

Column 4, Tables I and II, contains the outflow of the Platte and Arkansas Rivers, etc., as derived from the differences of the outflow of the Missouri River at Omaha (column 5), and at St. Charles (column 6). The figures for the months do not represent accurately the amount of outflow. But the sum probably gives an approximately correct value for the year.

Column 7, Table I, contains the outflow of the Upper Mississippi River at Grafton, Ill., just below the mouth of the Illinois River, from meter measurements on twenty days in March, twenty in April, twenty-five in May, twenty-four in June, twenty-six in July, twenty-four in August, and twenty-five in September. The outflow for the other months, as well as those for all the months of 1882 (column 7, Table II) are derived from the gauge readings. The outflow observations are given in Report of Mississippi River Commission for 1882, page 142, and 1883, page 2673.

Column 8, Tables I and II, contains the outflow of the Ohio River at Paducah, Ky. The quantities in Table II for 1882 are the result of meter measurements except the outflow for December. Those for 1881 and December, 1882, are computed from the gauge readings at Paducah given in manuscript in the Signal Office.

Column 11, Tables I and II, contains the outflow of the Atchafalaya River from December, 1881, to November, 1882, derived from meter measurements given in Report of Mississippi River Commission, 1883, page 2650.

Column 10, Table II, contains the outflow of the Mississippi Valley for 1882, including the Ohio, Missouri, Arkansas, Red, Atchafalaya Rivers, etc., as derived from meter measurements of the Mississippi at Red River Landing, La., just below the mouth of the Red River, and from meter measurements of the discharge of the Atchafalaya River, given in column 11. Column 10. Table I, gives the same thing for 1881 derived from gauge readings at Red River Landing and Barbre's Landing, with the exception of the month of December, the outflow for which depends on meter measurements made on eighteen days, and those for September and January, which are the Red River discharges at Alexandria, La.

Column 9, Tables I and II, contains the outflow from the Lower Mississippi Valley, the Arkansas, Red, Kaskaskia Rivers, etc., as derived by subtracting from the outflow of the whole Mississippi Valley (column 10), the sum of the outflows from the Missouri, Ohio, and Upper Mississippi (columns 6, 7, and 8). The differences for the months do not represent accurately the amount of the outflows. The sums for the years are, however, probably the approximately correct values of outflow.

The fact that for some months the sum of the outflows of the Missouri, Upper Mississippi, and Ohio Rivers is greater than the sum of the gaugings of the Mississippi at Red River Landing, and of the Atchafalaya, is due to the length of time it takes the water to travel from Cairo to the Red River.

Column 12, Tables I and II, contain the outflow of the Mississippi River at Columbus, Ky., derived from meter measurements given in the Report of the Mississippi River Commission for 1883, page 2607.

Column 13, Tables I and II, contains the outflow of the Mississippi River at Carrollton, La., just above New Orleans, as derived from the daily discharges given in the Report of the Mississippi River Commission for 1883, page 2683. The amounts do not embrace all the water of the Mississippi River, as about 18 to 26 cubic miles goes down the Atchafalaya River. During the flood of 1882 (and at other times also) a great deal of water escaped from the river through the various bayous and crevasses, and therefore did not pass the gauge at Carrollton or New Orleans.

Column 2, Table II, contains the outflow of the river at Hays' Landing, Miss., above Vicksburg, as derived from meter measurement, except for January. There were only twenty-three days measurements in November.

Column 3, Table III, contains the outflow of the Mississippi River at Carrollton, taken from the Report of the Mississippi River Commission for 1882, page 114. The outflow for December, 1880, however, was not measured. The value in Table III is the mean of the outflow for November, 1880, and January, 1881.

Column 3, Tables I and II, contains the river outflow at Helena in 1882, as derived from meter measurements, except for the months of January, November, and December, and for those months and all of 1881, as derived from the gauge readings.

TABLE I.—*River outflow in cubic miles.*

1881.

1	2	3	4	5	6	7	8	9	10	11	12	13
Month.		Helena.	Lower Missouri Valley, Platte, and Kansas.	Omaha.	St. Charles, Mo., whole Missouri Valley.	Grafton, Ill., Upper Mississippi Valley.	Paducah, Ohio Valley.	Lower Mississippi Valley, Arkansas, Kaskaskia, and Red River.	Whole Mississippi Valley, Ohio, Missouri, Atchafalaya, Red, etc.	Atchafalaya River.		Mississippi River, at Carrollton, La.
January	......	5.46	....	0.58	0.57	0.87	3.91	....	6.81	[0.41]	......	6.61
February	......	11.83	0.5	0.78	1.23	1.18	7.49	....	14.46	1.81	......	11.03
March	......	15.65	1.4	1.75	3.14	2.27	7.13	....	22.22	2.75	......	14.17
April	......	17.61	(0.6)?	(4.00)?	4.65	4.84	8.88	....	22.15	2.90	......	13.67
May	......	18.74	2.8	1.91	4.70	4.58	4.93	....	22.22	2.75	......	14.06
June	......	9.72	1.1	1.99	3.13	3.08	3.31	....	17.73	2.32	......	12.51
July	......	8.01	0.9	1.81	2.72	3.07	2.20	....	11.54	1.35	......	9.40
August	......	8.93	0.4	0.57	1.04	1.17	1.09	....	5.09	0.36	......	5.32
September	......	2.82	0.4	0.43	0.82	1.27	1.06	....	4.20	[0.20]	......	4.76
October	......	5.71	1.3	0.43	1.71	4.32	1.64	....	5.36	0.36	......	5.68
November	......	10.45	1.2	0.48	1.60	6.16	3.17	....	9.88	1.11	......	8.21
December	......	9.53	0.7	0.33	1.07	2.84	4.93	....	12.88	1.30	......	10.60
Year	......	119.46	11.3	(15.01)?	26.38	35.65	49.74	42.77	154.54	17.46	......	116.02

TABLE II.—*River outflow in cubic miles.*

1882.

1	2	3	4	5	6	7	8	9	10	11	12	13
Month.	Hays's Landing.	Helena, Ark.	Lower Missouri Valley, Platte, and Kansas Rivers.	Upper and Middle Missouri Valley, at Omaha.	Whole Missouri Valley, at St. Charles.	Upper Mississippi Valley, at Grafton.	Ohio Valley, at Paducah.	Lower Mississippi Valley, Arkansas, Red, Kaskaskia Rivers, etc.	Whole Mississippi Valley, Ohio, Missouri, Red, Atchafalaya, etc.	Atchafalaya River.	Mississippi River, at Columbus, Ky.	Mississippi River, at Carrollton, La.
January	16.76	18.29	0.36	0.48	0.84	1.77	16.69	....	18.98	2.44	21.87	13.29
February	15.96	20.96	0.81	0.42	1.23	1.87	17.61	....	22.08	2.88	23.02	13.55
March	17.42	25.70	1.24	0.36	1.60	2.93	16.18	....	29.57	4.03	22.92	16.42
April	15.63	18.00	1.00	0.69	1.69	3.89	6.87	....	28.36	3.67	13.83	15.34
May	15.90	17.64	1.17	0.87	2.04	5.00	8.46	....	24.79	3.24	16.37	14.81
June	17.50	17.86	0.80	1.96	2.76	5.30	8.03	....	22.90	3.28	15.50	13.96
July	16.13	15.78	1.47	1.95	3.42	4.76	4.16	....	21.65	3.14	12.62	14.13
August	8.91	8.25	0.55	0.71	1.26	1.76	2.79	....	12.10	1.60	5.99	10.63
September	5.74	5.29	0.13	0.43	0.56	1.15	2.47	....	6.08	0.54	4.46	5.87
October	4.36	4.72	0.10	0.45	0.55	1.02	1.44	....	4.92	0.42	3.41	5.30
November	4.06	4.82	0.38	0.32	0.70	1.33	1.27	....	5.10	0.49	3.75	4.95
December	....	4.75	0.08	0.32	0.40	0.98	2.11	....	6.18	0.67	....	5.83
Year	*138.37	162.06	8.09	8.96	17.05	31.76	88.08	65.15	202.71	26.40	*143.74	134.06

*Incomplete.

TABLE III.—*River outflow in cubic miles.*

1	2	3
Month.	1879. Missouri River at St. Charles, Mo.	1880. Mississippi River at Carrollton, La.
December, 1879	....	8.43
January	0.56	14.41
February	0.55	12.72
March	0.78	16.06
April	1.95	16.76
May	1.38	16.51
June	2.62	9.79
July	3.18	10.85
August	1.54	6.77
September	0.68	5.18
October	0.55	4.00
November	0.86	4.13
December	0.84	(5.37)?
Year	15.49	122.05

The outflow of the Mississippi River at Red River Landing and the Atchafalaya for 1881 was 154.5 cubic miles. Of this amount the Upper Mississippi above St. Louis furnished 35.6 cubic miles, or 23 per cent.; the Ohio, 49.7 cubic miles, or 32 per cent.; the whole Missouri Valley, 26.4 cubic miles, or 17 per cent. The amount of this Mississippi River water which passes Omaha was about 15 cubic miles, or 10 per cent. of the whole amount. If it be assumed that the amount of outflow from the Upper and Middle Missouri Valleys is the same, their areas are 174,000 and 161,000 square miles, the water furnished to the Mississippi by the Upper Missouri Valley, which includes the Yellowstone, Powder, and Missouri Rivers as far as Fort Buford, forms only 5 per cent. of its whole amount. That furnished by the Middle Missouri Valley, in which are situated the Bad Lands, is likewise only 5 per cent. of the whole amount flowing through the Lower Mississippi River.

The year 1881 was a year of great flood in the Missouri River. The Mississippi was not flooded. For the months of February, March, April, and May the outflow was 81 cubic miles as compared with 105 for the same time in 1882.

The Lower Mississippi Valley, with an area of 343,000 square miles, including the valleys of the Arkansas, Red, Yazoo, St. Francis, and Kaskaskia Rivers, etc., furnishes 28 per cent. of all the water of the Mississippi River.

The year 1882 was one of great flood in the Lower Mississippi River. The outflow at Red River Landing was 202.7 cubic miles. Of this the Upper Mississippi River furnished 16 per cent.; the Ohio 43 per cent.; the whole Missouri above Omaha 4 per cent.

The Upper and Middle Missouri Valleys furnished probably only 2 per cent. each of the entire amount.

The Lower Mississippi Valley including the Arkansas, etc., furnished 32 per cent. of the water of the Mississippi River.

For the three months of March, April, and May, 1882, when the water of the Lower Mississippi was very high, the outflow at Red River Landing and through the Atchafalaya was 82.7 cubic miles. During the same time there flowed through the Upper Mississippi River 11.8 cubic miles, or 14 per cent. of that of the Mississippi; through the Ohio, 31.5 cubic miles, or 38 per cent.; through the Missouri, 5.3 cubic miles, or 6 per cent.; through all the rivers of the Lower Mississippi Valley, the Arkansas, etc., 34.1 cubic miles, or 41 per cent. The water that flowed by Omaha was 1.92 cubic miles, or 2 per cent. of the flow of the whole Mississippi during the same time.

The water which flowed from the Upper and Middle Missouri Valleys during the months of March, April, and May, 1882, was therefore probably only 1 per cent. for each valley, of the water that flowed during the same time through the Lower Mississippi River.

Table II shows plainly that the flooding of the Lower Mississippi Valley in 1882 was due to the great discharge of water from the Ohio River, supplemented by heavy river flow or great rain-fall in the lower valley. The parts contributed to the flood by the Missouri and Upper Mississippi were small, especially that by the Missouri.

When the water in the Lower Mississippi River is high, a great deal of it escapes over the banks and levees. For eleven months in 1882, as may be seen from Table II, the river outflow at Columbus, Ky., a short distance below Cairo, is 143.7 cubic miles as compared with 138.4 cubic miles at Hays' Landing, a short distance above Vicksburg. The amount is 5.3 cubic miles less in addition to all the water that is added to the river by the affluents between Columbus and Hays' Landing.

Even when the river is not high there is some escape of water by seepage through the banks. The amount of this it is impossible to estimate.

Tables IV and V contain the velocities of the river waters at various places as determined by meter measurements. The velocities are the means for the whole cross-section of the river at each place.

Tables VI and VII contain the monthly means of the river gauge readings for a number of places during the years 1881 and 1882.

TABLE IV.—*Missouri River—Average velocity of river in miles per hour.*

Month.	Omaha.	St. Charles.	Kansas City.	Atchison, Kans.	Nebraska City.	Sioux City.
		1879.	1883.	1882.	1878.	
January						
February		2.2				
March		2.4				
	1880.					
April	3.7	3.4				
May	3.7	2.9			3.2	
	1882.					
June	5.3	3.9	4.2	3.8	4.0	
						1879.
July	4.6	3.8	3.3	3.7	3.1	4.4
August	2.9	2.8	2.6	2.2	2.3	3.1
September	2.4	2.1	1.8	2.0	1.9	2.5
	1878.					1878.
October	2.3	2.0	1.8	*1.8		2.2
November	2.7			*1.8		*2.4
December						

* One day.

TABLE V.—*Upper Mississippi River, etc.—Average velocity of river in miles per hour.*

1	2	3	4	5	6	7	8	9	10	11	12	13
Month.	Prescott, Wis.	Winona, Minn.	Clayton, Iowa.	Hannibal, Mo.	Grafton, Ill.	St. Louis, Mo.	Paducah, Ky.	Columbus, Ky.	Helena, Ark.	Hays' Landing, Miss.	Red River Landing, La.	Carrollton, La.
	1881.	1881.	1881.	1881.	1881.	1881.	1882.	1882.	1882.	1882.	1882.	1880.
January	0.8	1.0	0.7	1.0	0.9	1.6	3.0	4.9	3.7	4.0	3.7	3.3
February	0.5	1.0	0.7	1.2	1.2	1.6	3.3	4.9	3.8	4.0	4.0	3.1
March	0.8	1.0	0.9	1.8	2.1	3.7	2.9	4.7	4.2	3.8	4.2	3.5
April	1.7	1.7	1.6	....	2.9	4.2	2.0	3.3	3.3	3.8	4.0	4.0
May	1.7	2.2	2.3	3.1	2.7	3.8	2.2	3.5	3.3	3.6	3.4	3.6
June	1.6	2.0	1.9	2.8	2.2	3.7	2.0	3.5	3.8	4.2	3.3	2.6
July	1.4	1.7	1.6	2.8	2.2	3.5	1.5	3.0	3.1	3.8	3.0	2.6
August	1.2	1.5	1.2	1.6	1.2	2.1	1.5	1.8	2.5	2.7	2.2	1.8
September	1.7	2.2	2.0	2.5	1.4	2.3	1.5	1.5	2.3	2.2	1.7	1.5
October	2.0	2.6	2.7	....	2.2	4.0	1.1	1.2	2.0	1.8	1.6	1.4
November	....	....	....	....	2.1	4.7	1.0	1.4	2.2	1.8	1.7	....
											1881.	1879.
December	....	....	....	....	....	....	....	....	....	....	2.9	2.2

TABLE VI.—*Mean river gauge readings in feet.*

1881.

Month.	Omaha.	Leavenworth.	Boonville.	St. Charles.	Keokuk.	St. Louis.	Cairo.	Cincinnati.	Louisville.	Paducah.	Memphis.	Helena.	Vicksburg.	Red River Landing.	Carrollton.
Jan	8.1	5.2	4.1	6.9	......	8.4	17.1	20.8	8.5	17.2	10.2	16.2	18.5	16.1	3.6
Feb	9.0	6.8	6.4	11.6	......	11.5	32.9	33.0	18.8	30.1	23.6	32.6	34.1	33.2	10.2
Mar	12.4	11.5	11.5	17.4	......	18.8	35.3	27.4	10.3	27.7	27.9	38.1	41.3	39.2	12.2
Apr	18.8	18.4	16.3	22.4	15.1	27.0	40.7	29.2	11.5	30.9	31.2	40.6	41.1	39.5	12.2
May	10.6	14.6	14.7	20.5	13.0	23.8	34.3	16.1	7.6	21.2	29.1	40.7	41.1	39.2	12.2
June	12.3	15.3	13.8	18.0	11.2	22.4	24.6	16.5	7.4	12.1	19.1	27.0	31.1	35.4	11.0
July	10.7	12.5	12.2	16.2	11.0	21.1	21.0	7.8	5.1	7.4	16.8	23.7	25.2	25.4	6.9
Aug	7.1	8.7	7.7	10.4	4.6	11.3	9.9	5.0	3.7	2.2	7.4	12.6	13.0	11.5	2.0
Sept	6.0	7.1	6.0	8.1	6.8	10.7	7.4	3.5	2.7	1.1	4.0	7.3	4.7	4.0	1.4
Oct	6.2	7.3	8.3	13.6	......	21.8	19.0	4.4	3.5	5.4	11.9	18.2	15.2	12.7	2.5
Nov	6.0	7.0	7.6	13.1	......	25.2	28.0	14.9	7.4	14.9	20.0	28.0	26.6	23.8	5.9
Dec	5.3	5.4	5.5	10.5	......	17.8	28.6	24.9	10.4	21.1	20.5	25.9	29.7	28.3	8.4

TABLE VII.—*Mean river gauge, readings, in feet.*

1882.

Month.	Omaha.	Leavenworth.	Boonville.	St. Charles.	Keokuk.*	St. Louis.	Cairo.	Cincinnati.	Louisville.	Paducah.	Memphis.	Helena.	Vicksburg.	Red River Landing.	Carrollton.
Jan	5.4	3.9	3.6	8.3	......	12.3	42.3	42.0	19.0	41.1	30.9	40.7	39.5	35.8	11.4
Feb	5.7	3.8	4.8	11.6	......	14.6	47.8	44.0	22.6	46.7	34.1	45.6	48.9	42.1	13.2
Mar	5.8	6.1	6.4	13.8	......	18.1	46.2	34.2	14.8	42.5	34.3	45.9	46.7	47.1	14.6
Apr	7.6	8.4	9.4	14.4	......	21.0	34.4	18.2	8.7	24.7	28.1	40.2	45.1	46.6	14.0
May	8.5	10.8	10.2	15.4	......	23.9	37.7	30.1	12.3	28.1	29.0	38.9	41.6	42.7	12.9
June	11.0	13.0	12.5	18.8	......	26.7	38.2	26.3	11.2	26.4	29.9	40.4	41.3	41.7	12.6
July	11.4	14.3	13.6	19.9	......	25.9	32.0	17.2	8.4	18.6	25.7	36.6	39.8	40.5	12.2
Aug	7.6	8.4	8.1	11.8	......	14.3	19.1	13.7	7.6	9.9	13.5	21.9	24.2	28.2	8.4
Sept	5.6	5.5	5.0	7.3	......	9.6	14.4	13.9	7.5	8.6	9.2	16.1	14.3	14.7	3.3
Oct	5.5	5.6	4.1	6.8	......	8.6	9.1	9.0	6.0	4.6	5.2	11.0	9.8	10.5	2.0
Nov	4.8	5.4	4.2	7.9	......	10.6	10.9	8.7	5.5	4.2	6.2	11.8	10.0	11.3	1.7
Dec	(†)	3.0	1.4	5.6	......	6.8	11.0	12.7	7.0	7.3	5.8	11.2	10.5	14.0	2.7

* No record. † Frozen.

RAIN-FALL AND EVAPORATION.

In Tables VIII, IX, and X are given the quantities of rain-fall determined from curves of the depth of rain-fall plotted on maps and the areas they inclosed measured with a planimeter.

The map used was the census base map of the United States, on a scale of about one seven-millionth. On a map for each month the rain-fall in inches for the month was written near the place of observation. The observations of rain-fall include all made at regular Signal Service stations, and those by voluntary observers. The approximate number and distribution of places is shown on chart by red dots. The boundaries of the catchment basins of the six great valleys are shown by blue lines on the same chart.

The Upper Missouri Valley includes the country drained by the Upper Missouri River and its tributaries, above Fort Buford, Dak., west of longitude 104 degrees. Its area is about 173,940 square miles.

The Middle Missouri Valley includes the country drained by the Missouri River and its tributaries between Fort Buford, Dak., and Omaha. Its area is about 160,760 square miles.

The Lower Missouri Valley includes the country drained by the Missouri River and its tributaries between Omaha and St. Louis. Its area is about 210,540 square miles.

The Upper Mississippi Valley includes the country drained by the Mississippi River and its tributaries above St. Louis. Its area is about 171,800 square miles.

The Ohio Valley has an area of about 211,680 square miles.

The Lower Mississippi Valley includes all the territory drained by the Mississippi River and its tributaries below St. Louis, excluding the Ohio River. Its area is about 343,280 square miles.

Lines of equal depth of rain-fall were drawn on the maps. By means of the planimeter the areas between the rain-fall lines and the boundary lines of the valleys were measured. The sums of the products of the various areas of each valley in square miles multiplied by the depth of rain-fall of the area, the inches being converted into parts of a mile, give the total rain-fall for the valley in cubic miles.

Where the rain-fall observations in places near each other differed considerably there was some difficulty in putting in the lines. The monthly rain-fall in some cases varied from 15 inches to 2 inches at places only 50 miles apart.

The means of groups of rain-fall observations were taken and entered on the map. The lines were drawn mainly with reference to these mean values. When possible the lines were also made to follow the details of the groups.

TABLE VIII.—*Rain-fall, in cubic miles.*

1881.

Month.	Upper Missouri and Yellowstone Valley.	Middle Missouri Valley from Yellowstone to Omaha.	Lower Missouri Valley, Omaha to St. Louis.	Upper and Middle Missouri Valley to Omaha.	Whole Missouri Valley.	Upper Mississippi Valley above St. Louis.	Ohio Valley.	Lower Mississippi Valley below St. Louis.	Whole Mississippi Valley, Ohio, Missouri, etc.
January	5.12	1.95	2.51	7.07	9.58	3.16	11.36	9.37	33.47
February	1.83	2.78	6.18	4.61	10.79	8.71	16.01	22.76	58.27
March	0.75	3.48	4.50	4.23	8.73	5.45	11.96	9.88	36.02
April	2.24	3.44	5.24	5.68	10.92	3.89	12.54	13.08	40.43
May	2.95	9.49	14.06	12.44	26.50	9.53	9.56	28.05	73.64
June	6.81	9.06	11.02	15.87	26.89	15.26	17.59	12.43	72.17
July	2.89	5.24	8.94	8.13	17.07	10.63	8.63	9.55	45.88
August	2.38	6.02	4.59	8.40	12.99	9.14	4.56	7.50	34.19
September	2.41	6.85	12.13	9.26	21.39	19.18	11.15	19.87	71.59
October	2.58	3.73	10.23	6.31	16.54	16.13	14.44	22.57	69.68
November	1.59	1.34	3.72	2.93	6.65	7.17	15.12	16.15	45.09
December	0.46	0.36	1.55	0.82	2.37	3.48	18.12	9.71	33.68
Year	32.01	53.74	84.67	85.75	170.42	111.73	151.04	180.92	614.11

TABLE IX.—*Rain-fall, in cubic miles.*

1882.

Month.	Upper Missouri and Yellowstone Valley, 173,940 square miles.	Middle Missouri Valley and Yellowstone to Omaha, 160,760 square miles.	Lower Missouri Valley, Omaha to St. Louis, 210,540 square miles.	Upper and Middle Missouri Valleys, 334,700 square miles.	Whole Missouri Valley, 545,240 square miles.	Upper Mississippi Valley, above St. Louis, 171,800 square miles.	Ohio Valley, 211,680 square miles.	Lower Mississippi Valley, below St. Louis, 343,280 square miles.	Whole Mississippi Valley, Ohio, Missouri, etc., 1,272,000 square miles.
January	1.20	1.25	2.22	2.45	4.67	2.57	26.85	21.86	55.95
February	1.10	1.27	4.06	2.37	6.43	4.91	21.70	25.85	58.89
March	2.59	2.42	2.43	5.01	7.44	7.31	16.73	13.74	45.22
April	4.25	6.57	9.71	10.82	20.53	8.53	9.95	15.05	54.06
May	7.33	7.44	14.49	14.77	29.26	13.44	20.98	34.77	98.45
June	4.32	10.96	12.32	15.28	27.60	17.92	15.12	13.38	74.02
July	2.43	7.78	9.52	10.21	19.73	9.56	13.75	24.74	67.78
August	1.10	1.98	3.92	3.08	7.00	7.82	20.61	16.68	52.11
September	4.21	2.18	3.53	6.39	9.92	3.53	11.32	13.97	38.74
October	2.93	4.97	6.74	7.90	14.64	10.09	6.39	16.95	48.07
November	1.24	1.55	3.03	2.79	5.82	5.44	8.90	17.02	37.18
December	1.82	1.66	3.49	3.48	6.97	4.27	7.86	6.44	25.54
	34.52	50.03	75.46	84.55	160.01	95.39	180.16	220.45	656.01

TABLE X.—*Eighteen year normal rain-fall in cubic miles.*

Month.	Upper Missouri and Yellowstone Valleys.	Middle Missouri Valley from Yellowstone to Omaha.	Lower Missouri Valley, Omaha to St. Louis.	Upper and Middle Missouri Valleys to Omaha.	Whole Missouri Valley.	Upper Mississippi Valley above St. Louis.	Ohio Valley.	Lower Mississippi Valley below St. Louis.	Whole Mississippi Valley, Ohio, Missouri, etc.
January	2.19	1.27	2.75	3.46	6.21	3.52	12.96	13.31	36.00
February	1.51	1.71	3.08	3.22	6.30	4.23	12.58	13.13	36.24
March	2.29	2.74	4.51	5.04	9.55	5.33	12.34	13.77	40.99
April	2.90	5.61	7.49	8.51	16.00	7.15	12.45	18.40	54.00
May	6.26	7.00	8.48	13.26	21.74	9.84	11.91	17.36	60.85
June	5.30	4.11	11.38	9.41	20.79	13.04	15.50	21.82	71.14
Jnly	3.57	6,58	10.04	10.15	20.19	9.98	14.37	19.21	63.74
August	2.12	5.29	7.82	7.41	15.23	9.54	11.90	15.05	51.73
September	2.74	3.39	7.58	6.13	13.71	9.81	10.26	15.38	49.16
October	2.53	2.99	6.34	5.52	11.86	7.02	8.79	12.10	39.76
November	1.65	1.40	3.16	3.05	6.21	4.70	10.64	12.56	34.12
December	1.77	1.77	3.20	3.54	6.74	4.39	11.52	11.72	34.37
	34.83	43.86	75.83	78.69	154.53	88.55	145.22	183.81	572.10

EVAPORATION.

The amounts of possible evaporation in Table XI were derived in the same way as the rain-fall, from another set of charts, by means of the planimeter. The values of the evaporation used in drawing the curves were those for Signal Service stations given in the Weather Review of September, 1888, on page 238.

The amounts of water in the air in the various valleys are given in Table XII. These were derived from a set of charts, one for each month, by planimeter measurements.

The depth of water in the air in inches was obtained by means of the vapor pressures, corresponding to the monthly means of the temperature of dew-point at the various Signal Service stations, derived from observations of the whirled wet and dry bulb thermometers.

The months taken were July, 1887, to July, 1888. The means of the dew-points are the mean results determined three times a day at 7 a. m., 3 p. m., and 10 p. m., seventy-fifth meridian time.

For obtaining the vapor as depth of water Hann's formula was used after adapting it for degrees Fahrenheit and English inches. This is:

$$I=p\frac{3.00}{1+(\tau—32)\,a}$$

Where I is the depth of water in the air in inches τ is the mean temperature of the column of air containing the vapor, p is the pressure of the vapor in inches, a is the coefficient of expansion of gases for one degree Fahrenheit, equal to 0.00204.

Taking the temperature of the air at the surface of the earth as twenty degrees greater than the mean temperature of the column of air which contains the greatest part of the vapor, the formula becomes:

$$I=p\frac{3.00}{1+(T—52)\,a}$$

Table XIII gives the quantity of water that would be contained in the air if saturated.

TABLE XI.—*Possible evaporation in cubic miles of water.*

Month.	Upper Missouri and Yellowstone Valleys.	Middle Missouri Valley, Yellowstone to Omaha.	Lower Missouri Valley, Omaha to St. Louis.	Upper and Middle Missouri Valleys.	Whole Missouri Valley.	Upper Mississippi Valley above St. Louis.	Ohio Valley.	Lower Mississippi Valley.	Whole Mississippi Valley, Ohio, Missouri, etc.
January	2.47	1.46	5.18	3.93	9.11	1.67	5.43	11.26	27.47
February	3.99	2.63	6.91	6.62	13.53	2.76	6.66	12.92	35.87
March	4.13	2.73	7.69	6.86	14.55	4.01	8.84	16.49	43.89
April	12.47	10.10	17.10	22.57	39.67	7.54	16.19	27.20	90.60
May	12.59	10.14	14.27	22.73	37.00	8.23	15.39	27.50	88.12
June	14.12	12.51	21.83	26.63	48.46	11.19	20.75	31.81	112.21
July	21.53	16.00	23.70	37.53	61.23	14.65	19.20	34.47	129.55
August	17.77	12.60	19.61	30.37	49.98	12.92	20.34	32.48	115.72
September	15.17	11.86	17.67	27.03	44.70	9.96	17.70	29.23	101.59
October	9.45	8.01	13.36	17.46	30.82	8.14	14.11	25.37	78.44
November	7.24	6.06	12.20	13.30	25.50	5.39	10.98	19.83	61.70
December	4.53	2.20	6.76	6.73	13.49	2.48	6.09	11.67	33.73
Year	125.46	96.30	166.28	221.76	388.04	88.94	161.68	280.23	918.89

TABLE XII.—*Average quantity of moisture in the air in cubic miles.*

Month.	Upper Missouri and Yellowstone Valleys.	Middle Missouri Valley, Yellowstone to Omaha.	Lower Missouri Valley, Omaha to St. Louis.	Upper and Middle Missouri Valleys.	Whole Missouri Valley.	Upper Mississippi Valley above St. Louis.	Ohio Valley.	Lower Mississippi Valley.	Whole Mississippi Valley, Ohio, Missouri, etc.
January	0.28	0.32	0.68	0.60	1.28	0.44	1.37	2.24	5.33
February	0.79	0.63	1.23	1.42	2.65	0.65	1.60	3.12	8.02
March	0.63	0.62	1.18	1.25	2.43	0.79	1.69	3.11	8.02
April	1.33	1.32	1.93	2.65	4.58	1.57	2.33	4.95	13.43
May	1.65	1.76	2.83	3.41	6.24	2.23	3.67	6.24	18.38
June	2.47	2.95	3.97	5.42	9.39	3.68	5.00	8.50	26.57
July	2.74	3.29	4.70	6.03	10.73	4.39	6.32	9.68	31.12
August	2.56	3.07	4.51	5.63	10.14	3.62	5.03	9.27	28.06
September	2.21	2.41	3.77	4.62	8.39	2.93	4.09	7.69	23.10
October	1.37	1.30	2.00	2.67	4.67	1.62	2.54	4.55	13.38
November	0.86	0.75	1.29	1.61	2.90	1.13	1.82	2.96	8.81
December	0.56	0.56	0.94	1.12	2.06	0.82	1.59	2.52	6.99

TABLE XIII.—*Average quantity of water in the air in cubic miles—air saturated.*

Month.	Upper Missouri and Yellowstone Valley.	Middle Missouri and Yellowstone to Omaha.	Lower Missouri and Omaha to St. Louis.	Upper and Middle Missouri Valleys.	Whole Missouri.	Upper Mississippi Valley above St. Louis.	Ohio Valley.	Lower Mississippi.	Whole Ohio, Missouri, Mississippi, etc.
January	0.45	0.38	1.05	0.83	1.88	0.60	1.74	3.09	7.31
February	1.11	0.79	1.88	1.90	3.78	0.93	2.08	4.32	11.11
March	0.87	0.87	1.94	1.74	3.68	1.27	2.37	4.87	12.19
April	2.42	2.33	4.09	4.75	8.84	2.56	4.01	8.68	24.09
May	2.87	2.80	4.49	5.67	10.16	3.25	5.17	9.74	28.32
June	4.19	4.72	7.15	8.91	16.06	5.25	7.61	13.07	41.99
July	5.39	5.81	8.52	11.20	19.72	7.09	9.71	15.71	52.23
August	4.72	4.82	7.41	9.54	16.95	5.78	8.06	14.61	45.40
September	3.76	3.88	5.89	7.64	13.53	4.37	6.32	11.90	36.12
October	2.19	2.11	3.59	4.30	7.89	2.55	3.94	7.24	21.62
November	1.43	1.37	2.53	2.80	5.33	1.77	2.84	5.35	15.29
December	0.82	0.69	1.50	1.51	3.01	1.08	2.04	3.53	9.66

The ratio of river outflow to rain-fall as derived from the figures in Tables I and II, VIII and IX, are as follows:

	1881.	1882.	Mean.
Upper and Middle Missouri Valley, 334,700 square miles	1 : 5.7	1 : 9.4	1 : 7.6
Lower Missouri Valley, 210,540 square miles	1 : 7.5	1 : 9.3	1 : 8.4
Missouri Valley, 545,240 square miles	1 : 6.5	1 : 9.3	1 : 7.9
Upper Mississippi Valley, 171,800 square miles	1 : 3.1	1 : 3.0	1 : 3.0
Ohio Valley, 211,680 square miles	1 : 3.0	1 : 2.0	1 : 2.5
Lower Mississippi Valley, 343,280 square miles	1 : 4.2	1 : 3.4	1 : 3.8

The above ratios between rain-fall and river outflow are not of much value in estimating the amount of river outflow from the rain-fall.

The ratio for the Ohio Valley in 1881 is one-third, while in 1882 it is one-half. The rain-fall for 1881 is 151 cubic miles. For 1882 it is 180 cubic miles. From this it would seem that when the rain-fall is heavy, a much greater part of it reaches the rivers than when it is light. Evaporation from the ground is a potent cause in diminishing river outflow, as may be seen in the table following. The rain-fall, the river outflow, and possible evaporation for the Ohio Valley are shown side by side in the table.

The column headed "Water possible to enter the air" is the average for each month of the difference between the amount of water contained in the air in cubic miles, and the amount it would contain if saturated, and is the amount which it is possible for the air to take up at any time for the average of the month.

OHIO VALLEY.

Month.	Rain-fall.	Possible evaporation.	Water possible to enter air at any time.	River outflow.
1881.	*Cubic miles.*			
January	11.36	5.43	0.37	3.91
February	16.01	6.66	0.48	7.49
March	11.96	8.84	0.68	7.13
April	12.54	16.19	1.68	8.88
May	9.56	15.39	1.50	4.93
June	17.59	20.75	2.61	3.31
July	8.63	19.20	3.39	2.20
August	4.56	20.34	3.03	1.09
September	11.15	17.70	2.03	1.06
October	14.44	14.11	1.40	1.64
November	15.12	10.98	1.02	3.17
December	18.12	6.09	0.45	4.93
1882.				
January	26.85	5.43	0.37	16.69
February	21.70	6.66	0.48	17.61
March	16.73	8.84	0.68	16.18
April	9.95	16.19	1.68	6.87
May	20.98	15.39	1.50	8.46
June	15.12	20.75	2.61	8.03
July	13.75	19.20	3.39	4.16
August	20.61	20.34	3.03	2.79
September	11.32	17.70	2.03	2.47
October	6.39	14.11	1.40	1.44
November	8.90	10.98	1.02	1.27
December	7.86	6.09	0.45	2.11

For March, 1882, the rain-fall is 16.73 cubic miles, and the river outflow 16.18 cubic miles. Possibly some of it is melted snow, that fell in January or February. The possible evaporation for the month is 8.84 cubic miles. For the month of August the rain-fall, river outflow, and possible evaporation are 20.61, 2.79, and 20.34 cubic miles. The great difference in the river outflow for these two months must be attributable mainly to the difference in evaporation. Any rule, therefore, derived for estimating the river outflow from the observed rain-fall ought, in order to be approximately correct, to involve the truth that the outflow is much less as possible evaporation is greater.

The least amount of river outflow for any month is that for September, 1881, 1.06 cubic miles. The rain-fall for September is 11.15 cubic miles. It is probable that there would be a river outflow in any month of something less than a cubic mile even if there was no rain-fall whatever during the whole month.

A part of every rain-fall sinks into the ground beyond the reach of evaporation, and is fed out slowly to streams through springs. The earth acts as a reservoir for this water and the quantity fed out is probably very nearly constant at all times of the year. This flow will be called the perennial flow.

A part of every rain-fall goes into the streams and rivers directly as soon as it falls. From the fact that for the month of August, 1882, the river outflow is 2.79 cubic miles while the rain-fall is 20.61 cubic miles, it may be inferred that this part is very small. This part that goes into the river at once will be called the instantaneous flow.

To determine for the Ohio Valley the amount of the perennial and instantaneous flow, a number of months were selected having all small outflows and the rain-falls some as large as possible and others very small. An equation was formed for each month. The rivero utflow for the month was placed equal to a constant, *p*, plus an unknown fraction, *i*, into the amount of the rain-fall for the month. The solution of the equations gave for the value of *p*, the perennial flow 0.60 cubic miles, and for *i*, the ceofficient of instantaneous flow, the value one-twentieth.

The perennial flow being 0.6 of a cubic mile per month, for a year it will be 7.2 cubic miles. This amount is about one-twentieth of the normal rain-fall of the Ohio Valley for a year.

It will be allowable to suppose that the part of each rain-fall that sinks into the ground to feed the perennial flow will be in proportion to the rain-fall for each month.

The amount of each rainfall that passes into the ground or instantly into the river will be taken for the Ohio Valley as one-tenth of the whole rain-fall for each month. The remainder of the rain-fall will evaporate into the air or run into the rivers.

The amount of it that runs into the rivers will be less as the possibility of evaporation is greater. The part that evaporates will be considered to be in proportion to the number, e, expressing the possibility of the evaporation at any moment, and also to its second and third powers.

In conformity with these considerations, the observations of river outflow, rain-fall, and evaporation for the Ohio Valley for 1881 and 1882 have been treated by the method of least squares, and the following formula derived to obtain the river outflow from the rain-fall and evaporation.

R, is the rain-fall for the month in cubic miles; e, the quantity of water required to saturate the air at any time, equal to the difference between what the air contains and the amount if it was saturated. The outflow, O, is then as follows:

$$O=0.600+.95R-.90R\,(0.975\,e-0.421e^2+0.626e^3)$$

One-thirtieth of the whole amount should be added for months of thirty-one days, and one-fifteenth subtracted for February when it has twenty-eight days.

Previous to treating the observations by the method of least squares the river outflows were reduced to an equality of time, taken as thirty days for each month. As a great deal of the snow of winter time does not melt and run into the rivers for a month or more after it has fallen, the mean of the observations for January, February, and March was used in forming one observation equation which was given a weight of three. An equation based on the mean of December, 1881, January, February, and March, 1882, was given a weight of four. The other months were given a weight of one each. December, 1882, was not used.

The values of the evaporation used in the computation are taken from a smooth curve representing the tabular values.

Ohio Valley—River outflow in cubic miles.

	Computed.	Observed.	(Comp.)-(Obs.)
1881.			
January, February, March	8.1	6.2	+1.9
April	4.6	8.9	—4.3
May	3.2	4.8	—1.6
June	4.9	3.3	+1.5
July	1.9	2.1	—0.2
August	1.5	1.1	+0.4
September	3.5	1.1	+2.4
October	4.9	1.6	+3.3
November	6.4	3.2	+3.2
1881-1882.			
December, January, February, March	12.6	13.2	—0.6
April	4.0	6.9	—2.9
May	6.1	8.2	—2.1
June	4.3	8.0	—3.7
July	2.7	4.0	—1.3
August	4.8	2.7	+2.1
September	3.4	2.5	+0.9
October	2.5	1.4	+1.1
November	4.1	1.3	+2.8

Above are given the outflows computed by this formula alongside of those observed.

The accuracy with which the river outflow can be obtained by this formula is not very great, as may be seen from the residuals. But it is better than can be done by taking the outflow as a proportional part of the rain-fall.

The outflows computed by this method are not satisfactory. It points to the necessity of a study of the individual rain-storms that go to make up the rain-fall of a month and the consideration of the part of the valley in which the rain occurs, whether flat or mountainous, and likewise the character of the soil, its permeability or impermeability to water.

The data on which the formula is based is very imperfect. The river outflows for December, 1881, to December, 1882, being the results of direct meter measurements, are very accurate, probably within 5 per cent. of the true values. The outflows for January to December, 1881, being estimated from the river-gauge readings, in comparison with the meter measurements of the subsequent year, are not so accurate. With the same gauge reading at different times, the river discharge may be very different. When the river is in a rising stage the discharge is greater than it is for the same gauge reading when falling, as the river slope is so much greater.

The values of the rain-fall in cubic miles are subject to a large uncertainty, probably in some cases as much as 20 to 30 per cent. This is mainly owing to the sparsity of the rain-fall observations.

The values of the evaporation are also subject to a large uncertainty. Moreover they are values for the months of July, 1887, to July, 1888. The corresponding months of 1881 and 1882 may have had quite different evaporations. The evaporations for 1881 and 1882 were not computed, as the wet and dry thermometers on the readings of which the evaporations would have to be based were not whirled at that time. At low temperatures, humidity results derived from unwhirled thermometers are not of much value. Moreover in 1881 and 1882 no corrections were applied to the thermometers. The thermometers gave the air temperatures with sufficient accuracy, but not the humidity. Very small errors in the thermometers affect the results for humidity detrimentally.

For the Upper Mississippi Valley above St. Louis the perennial river flow is 0.50 of a cubic mile monthly. This is one-fifteenth of the normal annual rain-fall. The amount of the rain-fall that goes into the rivers instantly will be assumed to be one-twentieth part of the rain-fall, the same as for the Ohio Valley.

Proceeding in the same manner as for the Ohio Valley, using the means of several months rain-fall evaporation and river outflow as given below, the following formula is derived for the monthly river outflow in the Upper Mississippi Valley.

Upper Mississippi Valley.

$$O=0.50+0.93R-0.88R\ (1.131e-0.383e^2)$$

[Mean values].

	Rain-fall.	*e.*	Observed outflow.	Computed outflow.	Residuals (Comp.)-(Obs.)
1881.					
January, February, March, April	5.30	0.50	2.29	3.26	+0.97
May, June, July, August	11.14	1.94	2.90	1.97	−0.93
September, October, November	14.16	1.08	3.92	4.05	+0.13
1881-1882.					
December, January, February, March	4.57	0.35	2.32	2.99	+0.67
April, May, June, July	12.11	1.62	4.65	2.97	−1.68
August, September, October, November	6.72	1.35	1.29	1.87	+0.58

The perennial river outflow of the Upper and Middle Missouri Valleys above Omaha is 0.12 of a cubic mile monthly. This is one-sixtieth of the annual rain-fall. The quantity of water that goes into the rivers instantly will be taken as one-twentieth of the rain-fall, the same as for the other valleys.

The formula derived for the outflow of the river in the Upper and Middle Missouri Valleys by grouping the months as shown below, using the mean values of the rain-fall, evaporation, and outflow, is as follows:

$$O=0.12+0.98\ R-0.93\ R\ (0.91e-0.220e^2+0.009e^3).$$

[Mean values.]

	Rain-fall.	*e.*	Observed outflow.	Computed outflow.	Residuals. (Comp.)-(Obs.)
1881.	*Cu. miles.*				
January, February, March, April	5.40	0.87	1.77	4.24	+2.47
May, June, July	12.15	3.72	1.86	2.67	+0.81
August, September, October, November	6.72	2.41	0.46	0.18	−0.28
1881-1882.					
December, January, February, March	2.66	0.51	1.32	1.72	+0.40
April, May, June, July	12.77	3.24	2.30	1.28	−1.02
August, September, October, November	5.04	2.41	0.51	0.09	−0.42

The foregoing formulas can not be of much use, except in a very general way, to indicate what river stage may be expected when the rain-fall in its catchment basins is known. The determining factor of the amount of rain-fall that goes into the rivers directly after a rain-storm is the rate at which the rain has fallen. If a half-inch of rain fell for several days in succession, uniformly distributed throughout the twenty-four hours, it would not cause much of a rise in the rivers, as it would mostly all sink into the earth. But when 2 or 3 inches of rain falls over a large area in three or four hours there is not sufficient time for it to sink into the earth. The ground is covered with a sheet of water which promotes its rapid transfer to the rivers. The amount of water the soil holds is very great, and its capacity to hold more is almost indefinite. Observations made at the North Carolina agricultural station show that at a depth of 2 feet below the surface in a distance of 6 inches there is an amount of water equivalent to a depth of 2 inches.

It has been observed that a depth of 1 inch of water will percolate through a 7-inch stratum of hard packed soil in forty-eight hours when there is a depth of 2 or 3 inches of water above the soil. The same amount will go through the soil in four hours if the soil is loose. For water from the surface of the ground to reach a depth of 40 feet probably requires several months. This is inferred from the fact that the greatest outflow of wells at that depth, occur several months after the time of the year of maximum rainfall.

Floods are usually preceded by a series of preparatory rains soaking the soil. Then when a great rain comes, all of the water goes into the rivers. An interval of six days between the preparatory period and the heavy rain-fall will allow the ground to dry sufficiently, or the water to sink so deep in the ground that there may not be a flood. Even two or three days sometimes suffices for this, when the temperature is high and the water evaporates from the soil rapidly. Even during a long-continued dry period there is not much moisture taken out of the ground below a depth of 2 feet.

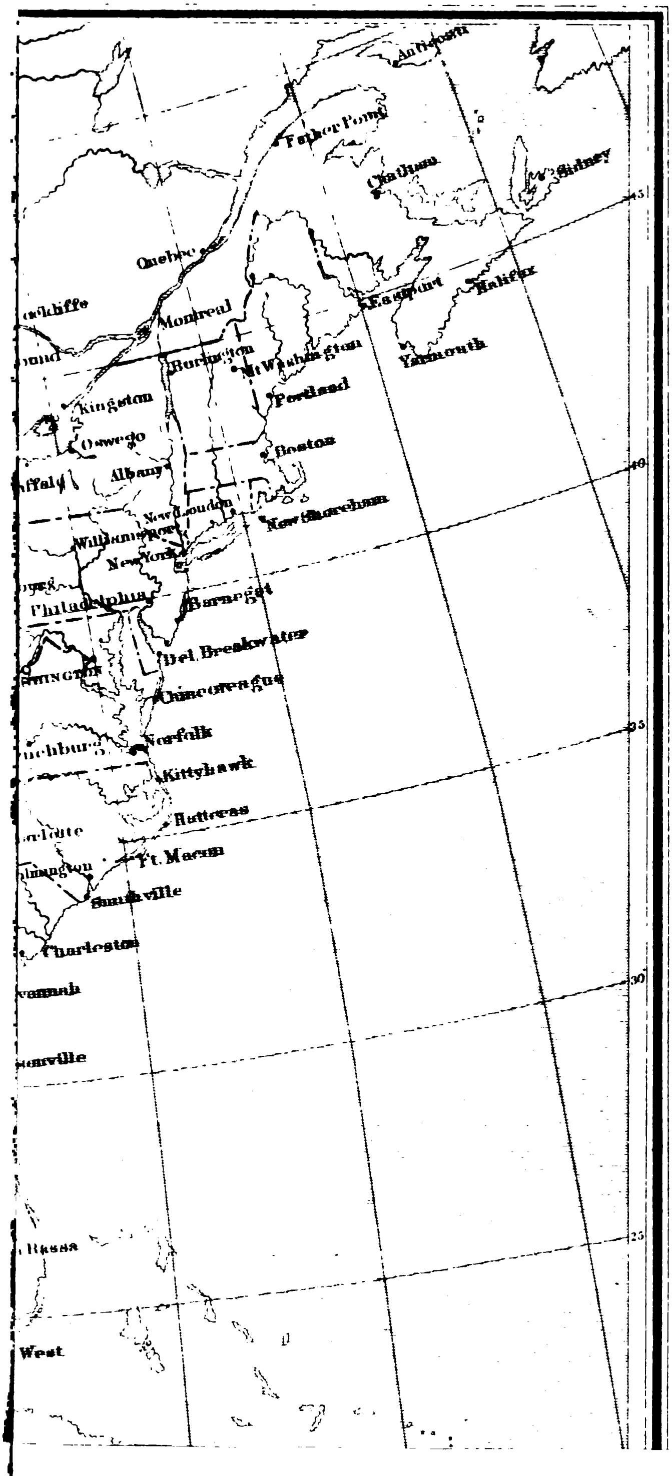
Since writing the above there has been received at the Signal Office a "Report on the Missouri Rain-fall, with averages for ten years ending December, 1887," by Francis E. Nipher.

On page 394 of the report are given the monthly river discharges at St. Louis in thousands of cubic feet per second from 1878 to 1887, inclusive. The sums of the monthly averages for the years 1881 and 1882 are 3,347 and 2,741 thousands of cubic feet per second, respectively. These correspond to a discharge of 58.9 cubic miles for the year 1881, and 48.2 cubic miles for 1882. From Tables I and II it will be seen that the discharge of the Mississippi River at St. Louis equal to the sum of the discharges of the Missouri at St. Charles and the Mississippi at Grafton. Columns 6 and 7, are for 1881, 62 cubic miles, and for 1882, 48.8 cubic miles.

Mr. Nipher's figures show the discharge for 1881 to be the greatest during the ten years 1878 to 1887. That for 1882 is the next greatest. For the various years the figures are as follows, being the sums of the average monthly discharges in thousands of cubic feet per second:

1878	2,287	1883	2,665
1879	1,535	1884	2,402
1880	1,854	1885	2,493
1881	3,347	1886	2,017
1882	2,741	1887	1,556

The minimum discharge, that for 1879, which is nearly the same as that for 1887 is about 27 cubic miles.


Anticosti
Father Point
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45
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Eastport
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Burlington
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Yarmouth
Kingston
Portland
Oswego
Boston
ffalo
Albany
40
New London
New Shoreham
Williamsport
New York
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Philadelphia
Barnegat
Del. Breakwater
SHINGTON
Chincoteague
35
Norfolk
nchburg
Kittyhawk
Hatteras
arlotte
Ft. Macon
lmington
Smithville
Charleston
30
vannah
sonville
25
Bassa
West

APPENDIX 15.

PREPARATORY STUDIES FOR DEDUCTIVE METHODS IN STORM AND WEATHER PREDICTIONS, BY PROFESSOR CLEVELAND ABBE.

This Appendix is printed separately as Part II of the Report of the Chief Signal Officer.

APPENDIX 16.

SIGNAL SERVICE STATIONS.—LATITUDE, LONGITUDE, ELEVATION OF BAROMETERS, AND CHANGES.

Stations.	Latitude.	Longitude.	Height Jan. 1, 1888.	Changes since January 1, 1888.
	° ′	° ′	*Feet.*	
Abilene	32 23	99 40	1,748	
Albany	42 39	73 45	85	
Alpena	45 5	83 30	609	
Apache	33 48	109 57	5,050	Closed March 31, 1888, as second-order station.
Assinaboine	48 32	109 42	2,690	
Astoria	46 11	123 48	38	Closed September 30, 1888, as second-order station.
Atlanta	33 45	84 23	1,129	Moved April 1, 1889; height 1,139 feet.
Atlantic City	39 22	74 25	34	Moved April 1, 1889; height 53 feet.
Augusta	33 28	81 51	183	
Baltimore	39 18	76 37	45	Moved January 1, 1889; height 76 feet.
Bidwell	41 53	120 11	4,640	Closed November 15, 1888.
Bismarck	46 47	100 38	1,681	
Block Island	41 10	71 36	26	
Boisé City	43 37	116 8	2,750	
Boston	42 21	71 4	125	
Bridger	41 28	110 30	6,643	Closed September 15, 1888.
Brownsville	25 53	97 26	57	
Buffalo	42 53	78 53	690	
Buford	48 0	103 56	1,930	Redetermined May 1, 1888; height 1,900 feet.
Cairo	37 0	89 10	359	
Canby	46 16	124 4	179	
Cedar Keys	29 8	83 2	22	
Charleston	32 47	79 56	52	
Charlotte	35 13	80 51	808	
Chattanooga	35 4	85 15	783	
Cheyenne	41 8	104 48	6,105	
Chicago	41 52	87 38	715	
Cincinnati	39 6	84 30	628	
Cleveland	41 30	81 42	690	Moved July 1, 1888; height 678 feet.
Columbus	39 58	83 0	812	Moved May 1, 1889; height 837 feet.
Concordia	39 35	97 41	1,384	
Corpus Christi	27 49	97 25	20	
Custer	45 42	107 34	3,040	
Davenport	41 30	90 38	615	
Davis	30 38	103 56	4,928	Closed December 31, 1888.
Denver	39 45	105 0	5,281	
Des Moines	41 35	93 37	866	Moved April 1, 1889; height 869 feet.
Detroit	42 20	83 3	662	
Dodge City	37 45	100 0	2,523	
Dubuque	42 30	90 44	665	Moved July 1, 1889; height 651 feet.
Du Chesne	40 35	109 50	4,900	
Duluth	46 48	92 6	672	
Eastport	44 54	66 59	53	
Elliott	35 30	100 21	2,690	
El Paso	31 47	106 30	3,764	Moved April 1, 1888; height 3,796 feet.
Erie	42 7	80 5	681	Moved August 1, 1888; height 714 feet.
Escanaba	45 48	87 5	608	Closed March 31, 1888, as second-order station.
Eureka	40 48	124 11	64	
Fort Smith	35 22	94 24	470	
Fresno	36 43	119 49	313	Moved February 1, 1889; height 328 feet.
Galveston	29 18	94 47	40	Moved April 1, 1888; height 44 feet.
Grand Haven	43 5	86 18	620	
Grant	32 39	109 57	4,860	Moved November 11, 1888; height 4,862 feet; January 3, 1889; height 4,860 feet.
Green Bay	44 31	88 0	616	
Harrisburg	40 16	76 52	....	Opened July 1, 1888; height 361 feet.
Hatteras	35 15	75 40	11	
Helena	46 34	112 4	4,069	
Huron	44 21	98 9	1,307	
Indianapolis	39 46	86 10	766	
Jacksonville	30 20	81 39	43	
Jupiter	26 57	80 7	28	
Kansas City	39 5	94 37	....	Opened July 1, 1888; height 947 feet.

Signal-Service Stations—Latitude, longitude, elevation of barometers, etc.—Continued.

Stations.	Latitude.	Longitude.	Height Jan. 1, 1888.	Changes since January 1, 1888.
	° ′	° ′	*Feet.*	
Keeler	36 35	117 50	3,622	
Keokuk	40 22	91 26	618	
Key West	24 34	81 49	22	
Knoxville	35 56	83 58	980	
La Crosse	43 49	91 15	744	
Lamar	37 32	94 15	1,028	Closed December 31, 1888.
Lansing	42 44	84 32	870	Moved February 1, 1888; height 883 feet.
Las Animas	38 4	103 12	3,899	Closed May 31, 1888; moved to Pueblo.
Leavenworth	39 19	94 57	842	
Little Rock	34 45	92 6	309	
Los Angeles	34 3	118 15	339	Moved November 1, 1888; height 330 feet.
Louisville	38 15	85 45	551	
Lynchburgh	37 25	79 9	652	Moved May 1, 1888; height 658 feet.
Mackinaw City	45 47	84 39	605	Closed March 31, 1888.
Maginnis	47 12	109 10	4,340	Closed June 30, 1889, as second order station.
Manchester	42 58	71 28	247	
Manistee	44 13	86 16	....	Opened July 1, 1888; height 615 feet.
Marquette	46 34	87 24	672	Moved July 1, 1889; height 735 feet.
Memphis	35 9	90 3	320	Moved February 1, 1889; height 349 feet.
Milwaukee	43 2	87 54	697	
Mobile	30 41	88 2	35	
Montgomery	32 23	86 18	217	
Montrose	38 30	107 56	5,780	Moved September 1, 1888; height 5,795 feet.
Moorhead	46 52	96 44	926	
Mt. Washington	44 16	71 18	6,279	
Nantucket	41 7	70 6	14	
Nashville	36 10	86 47	549	Moved July 1, 1889; height 553 feet.
New Haven	41 18	72 56	107	
New London	41 21	72 5	47	
New Orleans	29 58	90 4	52	
New York City	40 43	74 0	185	
Norfolk	36 51	76 17	30	Moved February 1, 1888; height 69 feet.
Northfield	44 10	72 41	872	
North Platte	41 8	100 45	2,841	
Olympia	47 3	122 53	36	
Omaha	41 16	95 56	1,113	
Oswego	43 29	76 35	335	
Palestine	31 45	95 40	533	Moved October 1. 1888; height 511 feet.
Parkersburgh	39 16	81 36	....	Opened July 1, 1888; height 638 feet.
Pensacola	30 25	87 13	30	Moved April 1, 1888; height 56 feet.
Philadelphia	39 57	75 9	117	
Pike's Peak	38 50	105 2	14,134	Closed October 18, 1888.
Pittsburgh	40 32	80 2	847	
Poplar River	48 8	105 10	2,000	Closed March 31, 1889.
Port Angeles	48 7	123 6	14	
Port Huron	43 0	82 26	639	
Portland, Me	43 39	70 15	99	
Portland, Oregon	45 32	122 43	80	
Prescott	34 33	112 28	5,389	
Pueblo	38 18	104 36	....	Opened June 1, 1888; height 4,724 feet.
Raleigh	35 45	78 37	375	
Rapid City	44 4	103 12	3,230	
Red Bluff	40 10	122 15	342	
Rio Grande City	26 28	98 48	230	
Rochester	43 8	77 42	621	
Roseburgh	43 13	123 20	523	
Sacramento	38 35	121 30	64	
St. Louis	38 38	90 12	571	
St. Paul	44 58	93 3	831	
St. Vincent	48 56	97 14	804	
Salt Lake City	40 46	111 54	4,348	
San Antonio	29 27	98 28	781	
San Diego	32 43	117 10	66	Moved January 1, 1889; height 93 feet.
Sandusky	41 25	82 40	638	Moved April 1, 1888; height 629 feet.
San Francisco	37 48	122 26	60	
Santa Fé	35 41	105 57	7,026	
Sault Ste. Marie	46 28	84 22	....	Opened April 1, 1888; height 642 feet.
Savannah	32 5	81 5	87	
Shreveport	32 30	93 40	227	Moved February 1, 1888; height 249 feet.
Sill	34 40	98 23	1,200	
Sioux City	42 29	96 24	....	Opened July 1, 1889; height 1,158 feet.
Spokane	47 40	117 25	1,909	
Springfield, Ill	39 48	89 39	644	
Springfield, Mo	37 12	93 18	1,356	
Stanton	33 30	105 26	6,150	Moved January 26, 1888; height 6,154 feet.

Signal-Service Stations—Latitude, longitude, elevation of barometers, etc.—Continued.

Stations.	Latitude.	Longitude.	Height Jan. 1, 1888.	Changes since January 1, 1888.
	° ′	° ′	*Feet.*	
Sully	44 39	100 39	1,600	
Tatoosh	48 23	124 44	86	Closed March 29, 1889.
Titusville	28 34	80 51	12	Moved July 1, 1889; height 44 feet.
Toledo	41 40	83 34	651	Moved February 1, 1888; height 678 feet.
Totten	47 57	98 57	1,487	Closed January 31, 1889.
Valentine	42 50	100 32	2,614	Moved October 28, 1888; height 2,613 feet.
Vicksburgh	32 22	90 53	222	
Walla Walla	46 2	118 20	1,018	
Washakie	43 1	108 54	5,580	
Washington City	38 54	77 3	106	Moved August 15, 1888; height 103 feet; March 22, 1889; height 112 feet.
Wichita	37 41	97 20	....	Opened July 1, 1888; height 1,354 feet.
Wilmington	34 14	77 57	52	
Winnemucca	40 58	117 43	4,358	Moved March 1, 1888; height 4,340 feet.
Wood's Holl	41 33	70 40	22	
Yankton	42 54	97 28	1,234	
Yuma	32 45	114 36	141	

APPENDIX 17.

Monthly and yearly meteorological summaries at stations of the Signal Service, U. S. Army.

NOTE.—This appendix contains data for the year ending December 31, 1888. All observations
columns immediately underneath. Beginning on July 1, observations were taken at 8 a. m. and
References: Large *H* represents the height of the barometer above sea-level; *T* and small *h*, the
ters of the alphabet opposite data indicate the number of days missing from the record; thus *a* de-

ABILENE, TEX.

[Latitude, 32° 14′ N.; longitude, 99° 45′ W.]

Months and year.	Pressure.			Temperature.						Mean.		Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	7 a.m.	3 p.m.	10 p.m.	Mean.	Total.	Max. 24 hours.
	In.	*In.*	*In.*	°	°	°	°	°	°	°	°	°	°	°	°					*In.*	*In.*
J....	28.364	28.92	28.01	33.4	44.7	38.5	38.9	75	-5	50.4	27.3	30	35	34	33	88	70	84	81	0.76	0.55
F ...	28.206	28.71	27.81	43.0	53.9	47.1	48.0	77	21	59.2	38.0	41	46	44	44	93	76	89	86	2.40	1.09
M ...	28.230	28.78	27.71	42.3	57.2	50.0	49.8	87	23	62.3	39.5	39	41	43	41	89	60	78	76	1.16	0.40
A ...	28.243	28.61	27.89	58.0	72.5	65.7	65.4	92	42	75.6	55.8	55	56	58	56	90	61	79	77	5.16	1.62
M ...	28.080	28.33	27.82	61.9	77.6	69.3	69.6	95	50	80.6	59.6	58	58	63	60	88	53	80	74	3.63	1.56
J	28.085	28.29	27.84	70.8	85.5	77.2	77.8	99	60	88.4	67.9	67	65	68	67	88	53	74	72	2.79	1.65
J	28.222	28.41	28.06	75.8	....	88.1	82.0	96	66	92.8	72.3	67	.....	64	66	75	.....	46	60	0.46	0.39
A ...	28.174	28.39	27.96	73.8	....	86.7	80.2	103	62	92.2	71.3	67	.....	65	66	80	.....	53	66	4.08	2.37
S	28.254	28.49	28.06	64.7	....	79.7	72.2	94	52	86.2	62.3	60	.....	62	61	85	.....	56	70	0.05	0.05
O ...	28.199	28.45	27.93	56.1	....	67.7	61.9	92	40	75.8	58.8	52	.....	56	54	87	.....	66	76	2.00	1.88
N ...	28.295	28.61	27.81	44.0	....	51.1	47.6	85	28	56.4	41.7	41	.....	46	44	89	.....	86	88	4.80	2.14
D....	28.296	28.64	27.88	42.7	....	50.3	46.5	68	31	58.2	40.1	39	.....	44	42	88	.....	81	84	3.29	1.90
Y....	28.221	28.92	27.71	55.5	....	64.3	61.7	103	-5	73.2	52.5	51	.....	54	53	87	.....	73	76	30.6	....

ALBANY, N. Y.

[Latitude, 42° 39′ N.; longitude, 73° 45′ W.]

Months and year.	Pressure.			Temperature.						Mean.		Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	7 a.m.	3 p.m.	10 p.m.	Mean.	Total.	Max. 24 hours.
J.....	30.077	30.77	29.38	12.5	18.7	14.5	15.2	45	-10	23.1	7.1	8	12	9	9	81	75	78	78	3.04	0.88
F.....	30.012	30.53	29.50	19.0	28.1	22.9	23.3	48	-10	32.1	12.5	14	18	17	16	80	66	80	76	2.07	0.53
M ...	29.965	30.46	29.30	22.3	31.0	25.6	26.3	52	0	34.1	17.8	17	19	19	18	80	62	78	73	5.62	2.29
A.....	29.999	30.46	29.42	38.3	50.3	42.3	43.6	88	22	52.9	34.1	29	26	32	29	70	44	69	61	1.95	0.66
M ...	29.900	30.24	29.59	53.2	64.3	35.6	57.7	79	33	66.7	48.4	45	48	48	47	75	58	77	70	2.98	0.93
J.....	29.817	30.13	29.54	64.6	77.2	66.3	69.4	96	46	79.5	59.0	57	59	58	58	76	57	76	70	3.18	1.04
J.....	29.897	30.15	29.29	67.6	....	72.9	70.3	90	52	82.0	59.7	59	.....	61	60	74	.....	67	70	2.52	1.00
A.....	29.867	30.23	29.54	68.2	....	71.4	69.8	90	49	81.0	61.5	60	.....	64	62	76	.....	78	77	4.74	2.14
S.....	29.978	30.54	29.51	58.1	....	61.3	59.7	80	36	69.6	52.8	52	.....	54	53	80	.....	79	80	4.68	1.80
O.....	29.861	30.35	29.36	43.5	....	45.5	44.5	65	30	52.9	38.4	38	.....	39	39	82	.....	79	81	6.10	1.54
N.....	30.038	30.70	29.34	38.5	....	40.6	39.6	69	8	47.7	33.4	34	.....	34	34	85	.....	77	81	4.48	0.94
D.....	29.920	30.46	28.99	28.5	....	30.9	29.7	53	-2	36.8	22.8	24	.....	25	24	82	.....	79	80	3.30	1.96
Y.....	29.944	30.77	28.99	42.9	....	45.8	45.8	96	-10	54.9	37.3	36	.....	38	38	78	.....	76	75	44.7	....

ALPENA, MICH.

[Latitude, 45° ′5. N.; longitude, 83° 30′ W.]

Months and year.	Pressure.			Temperature.						Mean.		Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	7 a.m.	3 p.m.	10 p.m.	Mean.	Total.	Max. 24 hours.
J....	29.483	30.07	28.64	11.5	17.0	12.3	13.6	37	-16	20.3	5.3	8	11	8	9	84	78	84	82	1.84	0.34
F	29.335	30.14	28.47	13.6	20.8	17.3	17.2	48	-23	25.0	8.6	10	14	13	12	84	77	84	82	1.97	0.53
M ...	29.426	29.86	28.74	12.9	23.4	19.5	18.6	49	-10	26.5	9.7	9	18	16	14	86	81	86	84	2.24	0.52
A.....	29.464	29.80	28.78	30.9	38.5	34.1	34.5	71	10	42.0	27.6	27	30	29	29	85	73	82	80	2.82	1.50
M ...	29.291	29.76	28.75	42.3	47.9	43.3	44.5	72	27	51.2	38.2	37	39	37	38	82	74	80	79	3.03	1.04
J.....	29.265	29.66	28.89	60.5	65.0	60.4	62.0	87	35	72.5	52.1	53	52	52	52	77	66	75	73	3.06	0.94
J.....	29.368	29.56	29.06	62.8	....	65.6	64.2	88	46	73.1	54.6	56	.....	55	56	79	.....	70	74	1.56	1.12
A.....	29.331	29.67	29.04	59.5	....	64.6	62.0	90	39	72.8	53.6	54	.....	54	54	81	.....	69	75	3.33	1.43
S.....	29.376	29.81	28.81	50.8	....	56.1	53.4	82	32	62.4	46.1	47	.....	48	48	88	.....	77	83	2.41	1.06
O.....	29.282	29.71	28.68	40.3	....	43.0	41.6	66	26	48.6	36.3	36	.....	38	37	87	.....	82	85	2.90	0.68
N.....	29.454	30.01	28.90	33.6	....	36.0	34.8	67	12	40.4	29.9	30	.....	32	31	87	.....	85	86	2.13	0.72
D.....	29.326	29.78	28.75	25.8	....	28.9	27.4	47	5	32.5	22.1	22	.....	25	24	88	.....	86	87	2.07	0.82
Y.....	29.367	30.14	28.47	37.0	....	40.1	39.5	90	-23	47.3	32.0	32	.....	34	33	84	.....	80	81	29.4	....

APPENDIX 17.

Monthly and yearly meteorological summaries at stations of the Signal Service, U. S. Army.

were made on seventy-fifth meridian time. Appropriate headings show the data contained in the
8 p. m.
respective heights of thermometer and rain-gauge above ground; †additional directions. Let-
notes one day missing, *b* two days, etc.

ABILENE, TEX.

[*H*=1,748. *T*=64. *h*=53.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.0	5.2	4.0	4.8	8,346	37	NE,SW	SW.	15	14	2	1	19	34	5	3	0	13	9	9	0	6	5	20	0	0	0	J.
5.1	4.8	4.4	4.8	8,130	37	N., SW.	SW.	13	11	8	6	12	25	6	6	0	8	16	5	0	8	1	7	0	1	0	F.
5.5	4.7	3.3	4.5	10,922	37	S.	SW.	9	19	1	1	20	37	1	4	1	11	15	5	0	6	0	11	0	1	0	M.
5.9	6.3	4.6	5.6	8,664	60	SE.	SW.	12	12	4	4	22	27	1	7	1	7	15	8	0	8	0	0	2	5	0	A.
4.5	4.3	3.2	4.0	9,198	42	SW.	S.	8	11	10	4	31	26	1	2	0	13	15	3	0	5	0	0	2	8	0	M.
3.6	4.4	4.0	4.0	9,204	62	NE., S.	S.	2	4	3	7	60	13	0	0	1	9	17	4	0	7	0	0	13	7	0	J.
2.0	.....	2.7	2.4	6,857	36	SW.	S.	0	2	3	6	44	6	0	0	1	18	13	0	0	3	0	0	26	0	0	J.
3.9	.....	3.3	3.6	6,805	48	NW.	S.	8	5	8	2	26	6	2	2	3	13	11	7	0	7	0	0	19	7	0	A.
2.5	.....	3.2	2.8	5,540	42	SE.	S.	4	2	7	8	26	6	0	0	7	18	3	9	0	2	0	0	7	0	0	S.
3.3	.....	3.2	3.2	7,439	30	S.	SW.	6	14	1	2	13	20	0	2	4	19	4	8	0	4	0	0	1	1	0	O.
7.2	.....	6.6	6.9	5,438	38	N.	N.	15	10	3	2	10	7	1	3	9	5	5	20	0	7	0	3	0	3	0	N.
4.6	.....	3.2	3.9	5,465	32	SW.	SW.	6	1	2	3	9	17	8	10	6	13	6	12	0	6	0	4	0	2	0	D.
4.4	.....	3.8	4.2	92,008	.....	....	S.	98	105	52	46	292	224	25	39	33	147	129	90	0	69	6	45	70	35	0	Y.

ALBANY, N. Y.

[*H*=85. *T*=84. *h*=99.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
7.0	5.9	4.9	5.9	5,244	40	NW.	NW.	14	12	1	2	10	1	12	37	4	6	12	13	0	17	24	31	0	0	0	J.
7.4	6.5	4.6	6.2	4,223	36	SE.	NW.	14	9	1	3	19	2	9	24	6	6	12	11	0	11	11	29	0	0	0	F.
5.6	6.6	6.3	6.2	6,716	40	SW.	NW.	9	4	0	1	21	3	18	34	3	9	6	16	0	13	10	26	0	0	0	M.
4.3	5.5	6.0	5.3	4,705	35	S.	NW.	13	7	1	7	9	4	12	26	11	8	16	6	0	10	0	11	0	2	0	A.
6.5	7.0	5.6	6.4	4,434	30	SE.	S.	7	8	2	13	21	2	15	18	7	4	14	13	0	17	0	0	0	0	1	M.
5.7	4.6	2.8	4.4	3,019	30	N.	S.	6	3	0	7	21	5	13	8	27	8	19	3	0	14	0	0	2	5	0	J.
3.4	.....	3.7	3.6	3,750	45	N.	S.	7	2	0	12	15	1	6	11	8	17	7	7	0	8	0	0	0	2	0	J.
5.7	.....	4.5	5.1	3,918	30	W.	S.	4	2	0	5	19	2	12	11	7	10	9	12	0	13	0	0	0	0	0	A.
6.2	.....	5.0	5.6	3,009	23	NW.	S.	10	4	1	6	14	1	8	7	9	5	10	15	0	10	0	0	0	0	0	S.
6.9	.....	6.4	6.6	3,688	34	W.	NW.	6	0	1	5	12	2	11	17	8	2	13	16	0	16	0	2	0	0	0	O.
6.4	.....	5.9	6.2	5,599	36	NW.	S.	11	1	0	6	14	3	7	13	5	5	11	14	0	14	2	12	0	0	0	N.
7.4	.....	7.4	7.4	4,969	30	W.	S.	8	1	1	4	20	3	10	11	4	4	9	18	0	6	8	22	0	0	0	D.
6.0	.....	5.3	5.7	53,274	.....	....	NW.	109	53	8	71	195	29	133	217	99	84	138	144	0	149	55	133	2	9	1	Y.

ALPENA, MICH.

[*H*=609. *T*=63. *h*=54.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.9	7.8	6.1	7.0	7,130	48	SE.	W.	4	3	8	6	8	16	39	8	1	7	4	20	0	17	28	31	0	0	0	J.
7.3	8.0	6.3	7.2	6,194	30	SW.	W.	3	1	6	16	13	8	29	10	1	3	9	17	0	17	21	29	0	0	0	F.
7.0	6.4	5.3	6.2	7,755	36	W.	W.	7	3	10	13	4	4	32	19	1	8	9	14	0	14	21	30	0	1	1	M.
5.3	6.1	3.8	5.0	7,270	36	E.	NW.	6	5	7	20	6	1	21	21	3	9	15	6	0	9	4	23	0	1	2	A.
7.8	7.5	5.8	7.0	6,163	42	E.	SE.	7	5	18	27	2	5	15	13	1	3	13	15	0	17	0	6	0	0	1	M
5.2	5.4	3.7	4.8	5,688	30	SE.	SE.	10	3	9	24	10	8	13	10	3	7	21	2	0	12	0	0	0	4	0	J.
4.5	.....	5.5	5.0	5,602	36	NW.	SE.	2	3	4	19	1	4	10	15	4	6	8	17	0	11	0	0	0	3	1	J.
5.0	.....	5.3	5.2	6,266	39	SE.	NW.	6	5	4	4	2	11	13	17	0	9	8	14	0	12	0	0	0	2	1	A.
5.4	.....	4.1	4.8	6,558	30	SE.	W.	3	0	6	10	6	6	15	14	0	9	3	18	0	9	0	0	0	2	0	S.
8.0	.....	7.6	7.8	7,435	40	E.	W.	6	5	6	8	4	5	16	12	0	1	2	28	0	19	0	9	0	0	0	O.
8.4	.....	7.4	7.9	7,152	30	SW.	W.	5	8	7	4	4	6	15	11	0	2	3	25	0	17	5	17	0	0	0	N.
8.3	.....	7.7	8.0	7,981	36	NW.	W.	7	1	2	2	11	12	18	9	0	1	7	23	0	18	13	29	0	0	0	D.
6.6	.....	5.7	6.3	81,194	.....	....	W.	66	42	87	153	71	86	236	159	14	65	102	199	0	172	92	174	0	13	6	Y.

Monthly and yearly meteorological summaries—Continued.

FORT ASSINIBOINE, MONT.

[Latitude, 48° 32′ N.; longitude, 109° 42′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J. ...	27.224	27.66	26.68	-2.9	2.8	1.6	0.5	53	-38	10.8	-9.9	-12	-8	-8	-10	67	62	65	65	.46	.18
F.....	27.152	27.56	26.68	18.0	24.7	19.3	20.7	49	-22	30.1	11.7	11	15	12	12	73	68	72	71	1.47	.30
M ...	27.188	27.54	26.71	13.6	22.9	19.2	18.6	60	-26	29.2	8.4	6	12	11	10	72	65	70	69	.95	.30
A....	27.170	27.80	26.62	36.0	52.4	45.5	44.6	80	15	58.8	32.9	26	30	30	29	69	45	58	57	.50	.22
M ...	27.135	27.53	26.80	41.1	56.8	53.6	50.5	77	31	62.1	39.6	36	36	39	37	83	48	60	64	2.04	.86
J	27.019	27.33	26.67	51.7	64.7	61.3	59.2	91	32	70.7	49.2	46	44	48	46	81	51	64	66	4.49	1.00
J	27.190	27.49	26.88	57.2	....	78.7	68.0	102	44	83.6	53.6	47	.....	45	46	69	.....	33	51	.51	.26
A....	27.219	27.38	27.01	54.2	....	75.1	64.6	96	43	79.1	51.9	47	.....	45	46	78	.....	37	58	2.16	.83
S	27.231	27.69	26.90	47.7	....	70.7	59.2	93	33	76.9	45.0	37	.....	34	36	69	.....	28	48	.41	.16
O.....	27.103	27.44	26.54	36 2	....	50.0	43.1	79	16	58.9	33.2	27	.....	30	29	72	.....	49	61	.34	.10
N....	27.176	27.45	26.70	22.9	....	32.2	27.6	61	-6	41.5	17.0	14	.....	17	16	70	.....	57	64	.06	.05
D....	27.144	27.62	26.76	23.5	.. ..	27.2	25.4	61	-8	36.5	15.5	13	.....	16	15	67	.....	66	66	.60	.39
Y....	27.163	27.80	26.54	33.3	....	44.5	40.2	102	-38	53.2	29.0	25	.....	27	26	72	.....	55	62	14.00	....

ASTORIA, OREGON.

[Latitude, 46° 57′ N.; longitude, 124° W.]

J	29.967	30.68	29.38	32.9	35.2	35.9	34.7	60	10	40.1	30.1	30	31	33	31	90	86	89	88	13.84	2.74
F....	30.100	30.51	29.35	40.7	43.7	43.9	42.8	54	32	48.0	39.2	39	41	42	40	92	90	93	92	4.12	.76
M ..	29.969	30.36	29.44	40.7	49.5	45.8	45.3	64	28	53.2	38.9	38	43	41	41	90	81	84	85	6.6[illegible]	1.48
A....	30.085	30.32	29.68	45.5	54.3	52.0	50.6	66	36	58.0	43.4	41	47	46	45	85	78	82	81	4.04	1.08
M ...	29.943	30.21	29.65	51.9	59.7	57.6	56.4	77	46	65.0	50.2	47	50	49	48	84	70	74	76	0.79	.21
J	29.844	30.19	29.36	54.5	62.3	60.0	58.9	75	50	68.0	53.2	50	55	52	52	88	78	76	81	7.23	1.12
J	30.028	30.33	29.77	57.8	....	66.6	62.2	88	48	70.5	54.8	52	.....	55	53	80	.....	67	74	1.25	.41
A....	29.996	30.25	29.76	59.2	....	67.1	63.2	74	54	69.5	56.6	54	.....	58	56	83	.....	73	78	0.74	.39
S	29.970	30.27	29.66	58.4	....	66.1	62.2	80	49	68.6	56.2	53	.....	57	55	82	.....	74	78	2.32	1.75
O.....	(*)	....	....	....	....	....	....	.....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
N....	....	....	....	....	....	....	....	.....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
D....	....	....	....	....	....	....	....	.....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
Y ...	....	....	....	....	....	....	....	.....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....

* Observations discontinued September 30, 1888.

ATLANTA, GA.

[Latitude, 33° 45′ N.; longitude, 84° 23′ W.]

J	29.054	29.30	28.63	40.4	50.0	44.7	45.0	71	15	52.7	36.4	35	37	37	36	81	65	76	74	3.89	1.24
F....	28.905	29.32	28.48	44.2	53.6	49.3	49.0	68	13	56.3	41.5	39	42	41	41	84	68	76	76	5.91	1.47
M ...	28.937	29.26	28.48	43.9	57.0	50.8	50.6	77	24	60.5	41.6	36	38	37	37	74	52	61	63	8.16	2.03
A....	28.988	29.36	28.72	55.9	72.1	64.4	64.1	84	40	74.3	54.1	44	43	46	44	67	38	53	53	1.34	.63
M ...	28.812	29.04	28.62	61.9	75.4	67.1	68.1	88	44	77.6	59.5	56	56	56	56	83	54	71	69	6.86	8.33
J	28.848	29.17	28.66	69.0	81.1	74.3	74.8	93	55	85.0	66.5	64	62	64	64	84	55	72	70	4.71	1.99
J	28.914	29.09	28.78	73.5	....	80.3	76.9	94	65	88.4	69.9	67	.....	67	67	82	.....	65	74	1.85	1.03
A....	28.914	29.07	28.73	73.4	....	79.6	76.5	96	62	87.0	70.0	68	.....	68	68	83	.....	68	75	3.89	1.33
S.....	28.890	29.12	28.69	63.5	....	69.6	66.6	87	43	75.9	61.6	60	.....	61	60	88	.....	76	82	14.26	5.88
O....	28.886	29.14	28.46	52.3	... .	59.3	55.8	79	40	66.6	49.8	48	.....	48	48	86	.....	68	77	3.99	1.22
N....	28.948	29.21	28.64	46.6	....	53.4	50.0	77	28	59.8	45.0	42	.....	42	42	85	.....	68	76	4.70	1.80
D....	28.984	29.32	28.39	37.5	....	44.9	41.2	63	21	51.6	35.4	30	.....	32	31	76	.....	63	70	5.42	2.60
Y....	28.923	29.36	28.39	55.2	....	61.5	59.9	96	13	69.6	52.6	49	.....	50	50	81	.....	68	72	65.00	....

ATLANTIC CITY, N. J.

[Latitude, 39° 22′ N.; longitude, 74° 25′ W.]

J.....	30.162	30.80	29.56	25.4	31.6	27.9	28.3	53	2	38.5	21.0	20	24	23	22	80	73	81	78	3.96	1.00
F....	30.072	30.62	29.48	30.6	36.3	32.8	33.3	55	3	41.2	25.5	25	29	28	27	82	75	82	80	2.81	.92
M ...	30.033	30.53	29.36	30.2	35.9	32.4	32.8	70	10	41.3	26.1	25	29	28	27	82	78	83	81	4.15	1.21
A. ...	30.098	30.56	29.54	43.4	49.9	44.3	45.9	74	30	54.6	38.6	37	39	37	38	78	68	77	74	2.96	.69
M ...	29.972	30.26	29.68	53.7	57.1	54.4	55.1	74	40	62.4	50.4	49	52	50	50	85	84	85	85	4.02	1.31
J.....	29.913	30.22	29.67	65.2	69.9	64.6	66.6	90	50	74.7	60.5	59	59	58	59	82	70	81	78	3.33	2.72
J.....	29.996	30.20	29.63	69.8	....	69.5	69.6	91	55	76.8	63.7	63	.....	64	64	81	.....	83	82	2.44	1.34
A....	29.982	30.25	29.45	71.8	....	71.5	71.6	88	51	79.1	65.2	64	.....	66	65	77	.....	84	81	4.30	1.53
S.....	30.038	30.50	29.58	64.2	....	64.5	64.4	80	37	71.8	58.7	60	. ...	60	60	85	.....	86	85	7.14	1.54
O....	29.957	30.38	29.50	50.5	....	52.3	51.4	71	30	59.1	43.4	44	. ...	45	45	79	.....	77	78	3.48	.88
N....	30.090	30.70	29.17	46.1	....	48.0	47.0	69	26	52.8	41.6	42	. ...	43	42	86	....	82	84	2.71	1.21
D....	30.044	30.60	29.04	34.8	....	37.5	36.2	53	12	42.4	29.9	30	. ...	31	30	81	.....	78	80	2.84	1.63
Y....	30.030	30.80	29.04	48.8	....	50.0	50.2	91	2	57.9	43.7	43	....	44	44	81	.....	82	80	44.1	....

Monthly and yearly meteorological summaries—Continued.

FORT ASSINIBOINE, MONT.

[*H.*=2690. T.=16. *h.*=2.]

Cloudiness. (In tenths.)				Wind.													Number of days.										
7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.7	5.4	5.3	5.5	8,645	48	N.	SW.	8	5	13	0	2	31	21	8	5	8	13	10	0	10	23	26	0	0	5	J.
7.1	7.6	7.6	7.4	6.977	40	NW.	SW.	2	17	12	1	1	29	9	8	8	1	12	16	0	11	12	27	0	0	1	F.
5.9	6.6	5.8	6.1	6,845	44	SW.	SW.	7	14	10	2	3	23	8	16	10	5	18	8	0	7	16	28	0	0	3	M.
6.7	6.3	6.5	6.5	7,680	49	W.	NW.	3	13	12	0	4	17	17	19	5	4	15	11	0	7	1	16	0	0	0	A.
5.2	7.0	6.8	6.4	6,951	46	W.	E.	6	14	16	13	10	14	5	15	0	5	13	13	0	12	0	1	0	3	1	M.
6.6	6.6	6.8	6.7	8,513	54	W.	NW.	3	6	15	9	4	19	13	21	0	3	15	12	0	14	0	1	1	5	0	J.
2.9	.....	3.5	3.2	7,950	56	E.	SW.	4	4	15	1	5	15	12	6	0	19	7	5	0	6	0	0	6	4	0	J.
3.9	.....	4.4	4.2	6,086	37	NW.	E.	8	3	18	1	5	14	4	9	0	16	3	12	0	12	0	0	4	4	0	A.
4.3	.....	3.6	4.0	6,361	36	W.	SW.	6	3	8	4	8	17	6	7	1	16	9	5	0	4	0	0	1	1	0	S.
5.2	.....	5.9	5.6	7,444	40	SW.	W.	2	2	6	2	8	16	18	8	0	8	4	19	0	10	0	11	0	0	1	O.
3.4	.....	2.5	3.0	6,793	44	W.	SW.	0	4	5	3	5	28	6	6	3	19	5	6	0	2	6	29	0	0	0	N.
5.3	.....	5.2	5.2	8,783	48	SW.	SW.	4	5	4	1	7	27	9	5	0	8	4	19	0	4	11	28	0	0	1	D.
5.2	.....	5.3	5.3	89.028	.....	....	SW.	53	90	134	37	62	250	128	128	32	112	118	136	0	99	69	167	12	17	12	Y.

ASTORIA, OREGON.

[*H*=38. *T*=39. *h*=55.]

6.6	6.5	6.3	6.5	7,184	48	NE.	NE.	0	48	8	10	2	17	4	4	0	8	5	18	0	20	7	16	0	0	0	J.
6.5	6.8	6.6	6.6	3,897	48	SW.	SW.	0	20	8	6	3	21	6	1	22	5	9	15	0	16	0	0	0	0	0	F.
6.7	7.7	7.0	7.2	4,513	36	SW.	SW.	0	6	15	18	12	21	12	0	9	4	9	18	0	20	0	1	0	0	0	M.
6.6	6.0	6.7	6.4	3,926	28	SW.	SW.	0	5	5	3	5	35	20	3	13	7	5	18	0	20	0	0	0	0	0	A.
6.8	4.5	4.6	5.3	4,217	24	E.	W.	3	0	15	6	5	18	43	0	3	7	15	9	0	10	0	0	0	0	0	M.
8.9	7.8	8.1	8.3	2,843	25	SW.	SW.	0	0	0	1	3	44	26	1	15	2	6	22	0	17	0	0	0	0	0	J.
6.6	.....	3.7	5.2	5,111	22	NW.	SW.	1	1	4	0	5	23	21	7	0	17	5	9	0	7	0	0	0	0	0	J.
7.8	.....	3.5	5.6	4,282	20	W.	W.	0	0	1	2	11	16	24	8	0	14	6	11	0	5	0	0	0	0	0	A.
4.3	.....	4.1	4.2	3,962	24	NE.	SW.	0	10	1	0	1	28	11	8	1	15	4	11	1	9	0	0	0	1	0	S.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	O.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	N.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	..	D.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	Y.

ATLANTA, GA.

[*H*=1,129. *T*=83. *h*=74.]

5.8	5.7	5.0	5.5	7,738	34	NW.	W.	3	1	18	3	3	14	26	25	0	8	12	11	1	15	0	11	0	0	0	J.
6.3	6.1	5.3	5.9	6,459	36	SW.	W.	2	0	21	8	8	15	22	11	0	6	12	11	0	12	0	2	0	0	0	F.
4.6	4.2	3.2	4.0	8,519	48	NW.	NW.	7	1	6	8	15	9	16	31	0	15	10	6	0	11	0	8	0	2	0	M.
3.2	3.5	2.4	3.1	6,868	28	W.	W.	12	2	5	17	4	6	25	19	0	15	13	2	0	4	0	0	0	1	0	A.
5.6	6.7	3.9	5.4	6,391	31	E.	SW.	7	4	13	5	10	22	18	14	0	8	12	11	0	15	0	0	0	5	0	M.
4.9	6.7	3.5	5.0	4,976	42	SW.	W.	4	3	7	10	11	10	26	19	0	6	18	6	0	10	0	0	5	6	0	J.
3.9	.....	4.2	4.0	5,147	26	W.	NW.	7	3	11	8	8	5	6	13	1	6	22	3	0	11	0	0	12	6	0	J.
4.3	.....	4.9	4.6	5,094	30	SW.	S.	3	1	4	14	19	6	10	5	0	8	15	8	0	15	0	0	8	5	0	A.
5.3	.....	5.0	5.2	5,470	26	SW.	NW.	4	7	16	4	3	3	2	21	0	12	6	12	0	13	0	0	0	2	0	S.
5.2	.....	3.1	4.2	6,494	35	W.	NW.	1	1	11	11	2	6	12	18	0	13	9	9	0	10	0	0	0	0	0	O.
4.6	.....	3.3	4.0	7,091	30	NW.	E.	3	5	16	5	4	2	10	15	0	7	15	8	1	10	0	4	0	0	0	N.
3.8	.....	3.1	3.4	7,660	35	W.	NW.	0	2	11	8	3	3	10	25	0	15	10	6	0	7	0	9	0	0	0	D.
4.8	....	3.9	4.5	77,907	.....	....	NW.	53	30	139	101	90	101	183	216	1	119	154	93	2	133	0	34	25	27	0	Y.

ATLANTIC CITY, N. J.

[H=34. T=52. *h*=42.]

5.5	5.1	3.4	4.7	8,058	46	NW.	NW.	12	6	3	4	7	4	26	30	1	10	15	6	0	13	10	27	0	0	0	J.
6.0	6.2	4.1	5.4	6,567	46	NW.	NW.	16	9	5	4	6	10	12	25	0	7	14	8	0	11	2	22	0	0	0	F.
5.8	6.2	3.1	5.0	9,872	60	NW.	NW.	4	9	5	5	12	4	22	32	0	9	15	7	0	13	3	22	0	0	0	M.
4.3	4.7	2.4	3.8	7,275	36	SE.	S.	7	7	4	8	21	12	11	20	0	14	13	3	0	8	0	4	0	5	0	A.
6.9	6.8	3.8	5.9	6,456	24	SW.	S.	13	14	1	15	22	10	6	12	0	3	21	7	0	13	0	0	0	4	1	M.
2.8	4.9	2.8	3.5	6,307	36	E.	S.	6	12	14	5	23	14	7	9	0	13	16	1	0	5	0	0	1	1	0	J.
3.9	.....	3.8	3.8	6,149	24	NW.	SW.	5	9	5	4	11	12	6	9	1	10	12	9	0	11	0	0	1	0	0	J.
3.7	.....	4.4	4.0	6,131	30	S.	SW.	2	3	3	3	17	19	5	10	0	12	13	6	0	10	0	0	0	5	0	A.
6.1	.....	6.4	6.2	6,605	23	S.	NE.	6	16	2	5	5	10	8	8	0	10	8	12	0	14	0	0	0	0	0	S.
5.3	.....	4.3	4.8	8,138	36	W.	NW.	1	1	2	1	12	13	16	16	0	11	11	9	0	11	0	1	0	1	0	O.
5.2	.....	5.4	5.3	8,690	38	N.	W.	11	3	5	1	11	7	15	7	0	8	8	14	1	10	0	6	0	0	0	N.
4.5	.....	3.3	3.9	8,576	46	SE.	W.	1	1	0	3	5	16	21	13	2	14	11	6	0	6	2	16	0	0	0	D.
5.0	.....	3.9	4.7	88,825	.....	....	NW.	84	90	49	58	152	131	155	191	4	121	157	88	1	125	17	98	2	16	1	Y.

Monthly and yearly meteorological summaries—Continued.

AUGUSTA, GA.

[Latitude, 33° 28′ N.; longitude 81° 54′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	Maximum.	Minimum.	Mean. Maximum.	Mean. Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	7 a.m.	3 p.m.	10 p.m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J. ...	30.073	30.40	29.66	42.5	56.1	46.8	48.5	78	23	57.9	38.5	38	40	39	89	85	59	77	74	4.25	1.81
F. ...	29.932	30.37	29.55	44.2	59.2	50.7	51.4	74	22	61.5	42.7	41	45	45	41	89	62	81	77	4.54	1.47
M ...	29.954	30.34	29.48	46.1	63.1	52.8	54.0	81	28	65.7	43.1	41	46	44	44	84	57	73	72	7.79	2.86
A. ...	29.982	30.41	29.65	57.3	77.9	64.1	66.4	91	43	79.7	54.8	51	52	52	52	81	42	67	63	0.87	0.56
M ...	29.800	30.08	29.58	65.7	80.5	69.6	71.9	94	47	83.5	61.9	61	62	62	61	86	56	77	73	4.59	2.88
J.....	29.821	30.18	29.61	73.0	87.9	75.4	78.8	99	58	91.2	68.6	68	68	69	68	85	53	80	73	1.78	0.68
J.....	29.881	30.10	29.67	76.9	....	81.5	79.2	104	65	93.4	70.9	70	.....	69	69	79	.....	68	73	1.79	1.02
A.....	29.900	30.08	29.73	76.5	....	80.3	78.4	100	58	92.2	71.1	72	.....	72	72	85	.....	76	81	3.85	1.08
S.....	29.874	30.14	29.46	68.0	....	71.3	69.6	91	41	81.7	64.8	65	.....	66	65	90	.....	83	86	7.66	3.61
O.....	29.888	30.18	29..37	54.8	....	61.3	58.0	84	42	73.0	51.4	51	.....	55	53	88	.....	80	84	6.37	2.64
N ...	29.966	30.26	29.62	48.0	....	55.3	51.6	80	29	63.7	45.9	44	.....	48	46	86	.....	78	82	2.34	0.71
D ...	30.010	30.42	29.40	88.6	....	46.8	42.7	69	23	56.4	36.1	33	.....	39	36	83	.....	75	79	4.05	1.70
Y ...	29.923	30.42	29.37	57.6	....	63.0	63.5	104	22	75.0	54.2	53	.....	55	54	85	.....	76	81	49.9	....

BALTIMORE, MD.

[Latitude, 39° 18′ N.; longitude, 76° 37′ W.]

J.....	30.169	30.78	29.67	26.3	32.2	28.7	29.1	50	9	35.8	22.7	18	19	19	19	72	60	68	67	3.35	.94
F ...	30.058	30.62	29.49	31.7	40.1	34.7	35.5	60	11	43.1	28.3	24	25	25	25	76	57	70	68	2.83	1.06
M...	30.043	30.49	29.39	32.8	42.3	36.7	37.3	74	12	44.9	29.6	24	25	26	25	72	55	66	65	4.62	1.64
A ...	30.086	30.56	29.53	46.7	59.4	51.8	52.6	90	33	62.0	43.2	33	31	34	33	62	36	53	50	2.11	.89
M...	29 947	30.24	29.64	58.6	67.7	61.4	62.6	86	41	69.9	55.7	50	50	52	50	74	56	72	67	4.22	1.38
J.....	29.907	30.21	29.68	68.9	79.8	71.0	73.2	94	52	82.6	63.9	59	59	59	59	71	51	67	63	3.22	1.62
J.....	29.990	30.20	29.63	72.3	....	75.3	73.8	94	57	82.8	66.4	62	.....	62	62	70	.....	65	68	2.82	1.98
A ..	29.970	30.24	29.40	73.6	....	76.9	75.2	96	55	84.9	67.5	64	.....	65	64	72	.....	67	69	6.17	2.09
S.....	30.030	30.49	29.65	62.9	....	65.1	64.0	84	39	71.9	58.7	56	.....	57	56	79	.....	75	77	4.90	1.15
O ...	29.962	30.36	29.47	49.5	....	53.2	51.4	74	36	60.2	45.2	40	.....	42	41	71	.....	67	69	2.99	.89
N ...	30.107	30.68	29.43	45.1	....	48.4	46.8	74	25	54.6	41.2	37	.....	38	37	74	.....	68	71	3.04	1.14
D ...	30.056	30.58	28.90	33.8	....	38.0	35.9	58	16	44.3	30.9	24	.....	26	25	69	.....	62	65	3.26	2.56
Y ...	30.027	30.78	28.90	50.2	....	53.4	53.1	96	9	61.4	46.1	41	.....	42	41	72	.....	67	67	43.5	....

BISMARCK, DAK.

[Latitude, 46° 47′ N.; longitude, 100° 38′ W.]

J	28.348	28.74	27.84	-10.2	- 0.5	- 5.2	- 5.3	40	-37	4.4	-15.7	-14	- 7	- 8	-10	87	74	86	82	0.96	0.36
F....	28.223	28.90	27.74	6.9	14.6	10.7	10.7	46	-31	22.7	0.3	4	10	8	7	90	81	90	87	0.44	0.13
M ...	28.287	28.75	27.61	7.7	19.1	13.4	13.4	47	-20	22.2	3.4	4	12	11	9	87	75	89	84	0.87	0.52
A....	28.263	28.79	27.58	32.4	51.4	42.9	42.2	81	6	55.6	29.9	28	32	32	30	85	51	69	68	0.11	0.04
M ...	28.174	28.60	27.71	39.6	57.6	50.4	49.2	74	20	60.5	36.3	33	34	34	34	78	43	57	59	0.70	0.37
J	27.988	28.38	27.33	55.6	69.9	64.4	63.3	95	31	73.6	52.4	51	54	53	54	85	61	75	74	5.77	2.56
J	28.218	28.44	27.87	63.4	....	75.5	69.5	96	49	81.1	58.3	58	.....	60	59	84	.....	60	72	3.96	0.67
A....	28.236	28.54	28.00	56.1	....	71.3	63.7	98	36	77.1	52.0	51	.....	56	54	86	.....	60	73	1.73	0.50
S.....	28.256	28.57	27.91	46.9	....	65.3	56.1	93	29	74.0	44.0	41	.....	44	42	80	.....	48	64	0.33	0.31
O....	28.166	28.46	27.59	33.5	....	46.5	40.0	79	20	55.7	31.2	30	.....	34	32	89	.. ..	64	76	1.02	0.27
N ...	28.280	28.75	27.80	20.0	....	31.2	25.6	59	0	41.2	17.7	17	.....	22	19	88	.....	71	79	0.38	0.18
D....	28.216	28.59	27.73	16.8	....	24.9	20.9	57	- 5	33.0	13.3	14	.....	17	16	90	.....	75	82	0.24	0.18
Y ...	28.221	28.90	27.33	30.7	....	40.9	37.4	98	-37	50.1	26.9	26	.....	30	29	86	.....	70	75	16.51	....

BLOCK ISLAND, R. I.

[Latitude, 41° 10′ N.; longitude, 71° 36′ W.]

J	30.084	30.80	29.21	22.9	26.7	24.9	24.8	55	-3	32.7	16.3	20	20	18	19	88	77	76	80	2.12	.86
F	30.037	30.46	29.52	27.2	32.0	29.8	29.7	49	1	36.1	23.1	24	27	25	25	89	82	83	85	1.14	.31
M....	29.954	30.54	28.89	28.6	33.7	30.0	30.8	52	15	36.9	24.8	25	29	26	27	87	85	86	86	2.80	.88
A	30.063	30.53	29.50	39.2	44.1	40.1	41.1	60	27	47.0	35.5	34	34	34	34	82	71	79	77	1.35	.69
M	29.981	30.29	29.68	48.7	51.9	49.0	49.9	71	35	54.5	44.5	45	47	46	46	88	85	92	88	3.54	1.02
J	29.899	30.23	29.62	60.9	65.3	60.8	62.3	83	49	69.3	55.8	57	58	56	57	88	79	86	84	0.62	.30
J ..	29.971	30.25	29.46	64.4	....	64.1	64.2	81	53	70.9	59.3	60	.....	61	60	86	.....	90	88	1.03	.45
A	29.951	30.26	29.59	66.4	....	66.0	66.2	81	55	73.5	62.1	63	.....	63	63	89	.....	91	90	1.32	.45
S	30.046	30.60	29.22	59.8	....	60.4	60.1	75	44	65.7	55.9	55	.....	55	55	86	.....	85	85	5.49	1.40
O......	29.918	30.43	29.38	48.9	....	50.5	49.7	62	34	54.7	44.7	43	.....	44	44	81	.....	79	80	2.37	0.86
N ...	30.077	30.76	29.21	44.9	....	46.4	45.6	64	21	50.8	40.0	41	.....	42	41	85	.....	84	85	4.17	1.20
D	29.970	30.58	28.75	35.6	....	36.5	36.0	54	10	40.9	29.8	29	.....	30	29	77	.....	77	77	1.23	.48
Y.....	29.996	30.80	28.75	45.6	....	46.5	46.7	83	-3	52.8	41.0	41	.....	42	42	86	.....	84	84	27.2	.....

Monthly and yearly meteorological summaries—Continued.

AUGUSTA, GA.

[*H*=183. *T*=45. *h*=40.]

Cloudiness (in tenths).				Wind.													Number of days.										
7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calm.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90.	Thunder-storms.	Auroras.	Months and year.
5.4	5.9	5.0	5.4	2,850	18	S.	W.	6	18	1	0	6	13	26	13	10	8	13	10	0	10	0	7	0	0	0	J.
5.2	7.1	5.2	5.8	2,676	22	W.	NE.†	7	16	3	5	3	16	16	7	14	8	9	12	0	11	0	3	0	1	0	F.
4.9	4.2	3.8	4.3	3,092	24	SW.†	W.	8	8	7	10	13	7	22	10	8	14	8	9	0	10	0	3	0	1	0	M.
5.0	4.1	2.5	3.9	3,143	24	N.	S.	6	11	7	8	17	7	13	12	9	14	10	6	0	2	0	0	2	3	0	A.
6.0	7.4	4.7	6.1	3,164	25	NE.	SE.	7	7	7	21	13	10	10	7	11	7	11	13	0	10	0	0	8	4	0	M.
3.9	7.3	5.2	5.5	2,194	19	SW.†	S.†	1	11	5	15	15	12	11	7	13	6	16	8	0	12	0	0	18	7	0	J.
3.7	.....	6.1	4.9	2,498	33	SW.	NE.	2	13	9	12	5	12	3	1	5	7	10	14	0	9	0	0	23	7	0	J.
4.4	.....	5.6	5.0	2,165	24	SW.	SE.	1	9	7	19	16	1	0	0	9	9	10	12	0	10	0	0	22	7	0	A.
6.3	.....	5.7	6.0	2,768	25	W.	NE.	4	16	2	6	6	3	2	7	14	7	9	14	0	14	0	0	4	0	0	S.
4.4	.....	3.5	4.0	2,671	36	N.	W.	5	9	4	3	6	7	12	7	9	15	5	11	0	11	0	0	0	1	0	O.
5.0	.....	5.4	5.2	3,535	22	NE.	W.†	12	8	3	6	0	2	12	9	8	13	3	14	0	10	0	3	0	0	0	N.
3.5	.....	3.7	3.6	2,639	26	W.	W.	3	7	6	3	2	5	18	9	9	16	6	9	0	8	0	12	0	0	0	D.
4.8	.....	4.7	5.0	33,395	.....	....	W.	62	133	61	108	102	95	145	89	119	124	110	132	0	117	0	28	77	31	0	Y.

BALTIMORE, MD.

[*H*=45. *T*=75. *h*=69.]

6.8	6.3	4.8	6.0	4,551	30	NW.	NW.	11	15	8	7	5	3	12	31	1	5	14	12	0	11	11	28	0	0	0	J.
6.5	5.4	5.4	5.7	3,388	24	NW.	NW.	17	12	7	9	1	6	5	25	5	10	7	12	0	12	3	17	0	0	0	F.
5.5	5.8	4.2	5.2	5,495	33	NW.	NW.	10	14	7	12	2	4	8	36	0	11	10	10	0	14	5	18	0	1	0	M.
4.5	5.0	2.0	3.9	4,736	28	NW.	NW.	9	6	3	14	9	7	10	28	4	12	16	2	0	9	0	0	0	1	0	A.
8.1	7.3	6.8	7.4	4,041	22	S.	SE.	10	10	13	25	15	1	4	15	0	3	12	16	0	17	0	0	0	2	0	M.
3.8	4.8	3.8	4.1	3,949	28	SW.	NW.	10	14	8	11	9	14	5	17	2	14	11	5	0	7	0	0	8	5	0	J.
3.5	.....	4.7	4.1	3,806	23	W.	S.	10	4	6	6	13	12	7	3	1	13	11	7	0	8	0	0	2	1	0	J.
4.3	.....	4.2	4.2	3,690	45	SW.	SW.	6	2	1	2	16	21	6	7	1	12	12	7	0	12	0	0	8	4	0	A.
5.7	.....	5.8	5.8	3,570	18	NW.	N.	16	13	4	4	3	4	3	11	2	7	8	15	0	16	0	0	0	0	0	S.
5.6	.....	4.8	5.2	4,626	30	SW.	NW.	1	4	2	3	8	14	12	18	0	8	11	12	0	15	0	0	0	2	0	O.
5.5	.....	5.6	5.6	4,328	25	NW.	NE.†	9	11	2	6	6	3	10	11	2	8	6	16	0	10	0	7	0	0	0	N.
5.6	.....	3.5	4.6	4,276	36	NW.	NW.	5	5	1	5	1	11	12	15	7	11	13	7	0	7	1	15	0	0	0	D.
5.4	.....	4.6	5.2	50,456	.....	....	NW.	114	110	62	104	88	100	94	217	25	114	131	121	0	138	20	85	18	16	0	Y.

BISMARCK, DAK.

[*H*=1,681. *T*=16. *h*=2.]

3.3	4.6	3.7	3.8	5,655	54	NW.	NW.	6	9	7	9	2	3	8	33	16	13	13	5	0	10	26	31	0	0	1	J.
4.5	6.1	5.1	5.2	6,355	51	NW.	NW.	12	8	5	5	7	5	7	31	7	9	12	8	0	12	18	29	0	0	1	F.
5.3	6.1	4.1	5.2	8.045	50	NW.	NW.	3	14	13	10	6	3	7	31	6	7	19	5	0	11	22	30	0	0	3	M.
5.5	4.9	2.7	4.3	9,346	48	NW.†	NW.	13	8	11	13	13	1	5	21	5	7	21	2	0	5	1	18	0	0	2	A.
4.8	5.9	4.0	4.9	7,850	48	NW.	NE.	19	23	10	9	0	2	12	16	2	10	15	6	0	9	0	7	0	3	1	M.
6.5	6.8	4.7	6.0	10,021	48	N.	E.	11	7	21	14	9	4	12	11	1	9	10	11	0	18	0	1	2	7	1	J.
4.4	.....	3.9	4.2	6,689	47	NW.	E.†	9	10	10	9	4	2	9	8	1	11	14	6	0	14	0	0	3	8	0	J.
4.6	.....	4.3	4.4	5,487	32	NW.	NW.	5	7	7	7	7	3	8	16	2	11	11	9	0	11	0	0	4	1	1	A.
2.9	.....	3.0	3.0	7,582	37	NW.	NW.	6	7	6	10	4	3	4	19	1	14	14	2	0	2	0	4	2	0	0	S.
4.2	.....	5.8	5.0	7,111	50	NW.	NW.	5	4	8	6	2	3	6	15	13	14	5	12	0	8	0	18	0	0	0	O.
2.9	.....	3.3	3.1	4,879	48	NW.	E.	3	5	17	3	2	1	4	16	9	18	5	7	0	7	5	30	0	0	0	N.
3.8	.....	5.1	4.4	6,691	42	NW.	NW.	4	3	2	9	4	4	9	19	8	19	2	10	0	5	17	29	0	0	0	D.
4.4	.....	4.1	4.5	85,711	.....	....	NW.	96	105	117	104	60	34	91	236	71	142	141	83	0	112	89	197	11	19	10	Y.

BLOCK ISLAND, R. I.

[*H*=27. *T*=39. *h*=33.]

4.8	5.0	3.8	4.5	15,006	54	NW.†	NW.	14	3	3	7	2	2	11	51	0	10	17	4	0	12	14	30	0	0	0	J.
4.2	4.7	5.1	4.6	11,513	58	E.	NW.	10	13	7	4	2	7	16	28	0	11	11	7	0	10	7	25	0	0	0	F.
4.0	5.0	4.4	4.5	15,044	70	E.	NW.	12	7	5	6	1	8	12	41	1	13	9	9	0	14	8	22	0	0	0	M.
4.6	5.4	3.7	4.6	9,646	39	SE.	NW.	8	9	1	4	3	22	18	25	0	10	15	5	0	11	0	3	0	0	0	A.
7.1	7.7	6.9	7.2	9,940	36	E.	NE.	3	21	10	13	4	17	16	9	0	4	9	18	0	16	0	0	0	1	0	M.
5.4	6.2	4.9	5.5	9,941	40	NE.	W.	5	8	8	10	2	12	36	9	0	5	17	8	0	7	0	0	0	4	0	J
5.4	.....	5.0	5.2	10,195	43	NW.†	NW.†	1	10	1	4	1	16	11	16	2	13	9	9	0	8	0	0	0	0	0	J.
4.6	.....	4.6	4.6	10,923	48	SE.	W.	4	4	4	3	3	11	22	11	0	13	10	8	0	9	0	0	0	0	0	A.
6.9	.....	5.0	6.0	11,176	68	NE.	NE.	3	15	5	6	2	12	8	8	1	10	8	12	0	16	0	0	0	1	0	S.
5.2	.....	5.0	5.1	13,104	52	E.	NW.	5	2	5	4	3	10	10	23	0	13	6	12	0	14	0	0	0	0	0	O.
5.3	.....	5.2	5.2	15,913	84	NE.	NE.	4	15	3	5	1	13	9	10	0	11	6	13	1	16	1	5	0	0	0	N.
5.1	.....	3.5	4.3	14,983	70	NE.	NW.	6	4	2	2	1	7	17	23	0	16	9	6	0	8	4	16	0	0	0	D.
5.2	.....	4.8	5.1	147,384	.....	....	NW.	75	111	54	68	25	137	186	254	4	129	126	111	1	141	34	101	0	6	0	Y.

Monthly and yearly meteorological summaries—Continued.

BOISÉ CITY, IDAHO.

[Latitude, 43° 47′ N.; longitude, 116° 8′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
	In.	*In.*	*In.*	°	°	°	°	°	°	°	°	°	°	°	°					*In.*	*In.*
J ...	27.288	27.87	26.50	13.4	22.1	17.5	17.7	61	−28	26.8	8.1	6	16	12	11	78	78	79	78	1.54	0.40
F ...	27.257	27.56	26.84	34.2	45.4	41.3	40.3	64	24	49.3	29.9	29	32	31	31	82	61	68	70	0.50	0.28
M ...	27.133	27.56	26.75	34.0	48.7	45.4	42.7	66	18	53.7	30.9	27	29	29	28	77	49	54	60	0.51	0.20
A....	27.199	27.53	26.79	43.7	65.3	60.4	56.5	88	25	71.2	40.0	30	35	37	34	62	34	43	46	0.12	0.06
M ...	27.065	27.34	26.83	47.4	68.2	64.1	59.9	90	32	73.9	45.0	37	38	40	38	70	35	44	50	0.94	0.26
J ...	27.033	27.30	26.77	53.9	70.8	67.8	64.2	90	40	77.7	51.3	46	43	45	45	75	39	47	54	3.24	1.42
J ...	27.140	27.45	26.92	58.4	......	86.9	72.6	102	43	91.6	55.0	43	.....	41	42	58	.....	22	4[illegible]	0.48	0.38
A....	27.138	27.29	26.97	58.1	......	87.3	72.7	103	47	90.8	54.7	40	.....	39	40	54	.....	19	36	0.58	0.30
S ...	27.180	27.48	26.93	55.0	......	80.5	67.8	100	40	85.6	50.5	37	.....	42	40	52	.....	27	40	0.06	0.06
O ...	27.182	27.42	26.86	44.1	......	61.0	52.6	82	25	66.9	39.4	32	.....	34	33	63	.....	39	51	0.78	0.34
N ...	27.271	27.54	27.00	33.7	......	42.3	38.0	65	18	48.5	29.2	29	.....	30	30	84	.....	63	74	1.00	0.40
D ...	27.279	27.76	26.82	32.7	......	38.5	35.6	62	10	46.4	27.5	25	.....	28	26	76	.....	67	72	1.34	0.34
Y ...	27.180	27.87	26.50	42.4	......	57.8	51.7	103	−28	65.0	38.0	32	.....	34	33	69	.....	48	56	11.1	......

BOSTON, MASS.

[Latitude, 42° 21′ N.; longitude, 71° 4′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
J ...	29.956	30.70	28.96	16.5	24.0	19.5	20.0	57	−6	28.8	11.4	9	14	12	12	74	68	73	72	2.26	.81
F ...	29.934	30.32	29.38	24.3	33.0	27.9	28.4	56	−4	37.1	19.5	18	20	21	20	76	62	75	71	2.36	.66
M ...	29.843	30.46	28.95	27.9	36.6	31.5	32.0	58	10	39.7	24.8	20	22	23	22	74	59	73	69	3.32	.96
A....	29.946	30.40	29.43	39.2	46.1	41.2	42.2	66	21	50.5	34.6	27	27	27	27	63	54	61	59	2.04	.66
M ...	29.883	30.18	29.63	49.7	56.1	51.6	52.5	77	35	60.7	45.5	42	44	44	43	78	68	77	74	5.20	1.44
J ...	29.782	30.11	29.47	63.8	72.3	64.3	66.8	96	49	76.2	57.1	54	55	54	55	72	59	72	68	2.69	.65
J ...	29.854	30.16	29.25	67.7	......	68.9	68.3	89	51	77.4	60.1	56	.....	58	57	66	.....	70	68	1.79	.69
A ...	29.829	30.18	29.44	68.2	......	69.7	69.0	88	52	78.8	61.4	58	.....	59	59	71	.....	71	71	6.53	3.40
S ...	29.946	30.52	29.32	58.2	......	59.7	59.0	80	36	66.0	53.6	51	.....	52	52	79	.....	76	77	6.77	2.08
O ...	29.803	30.38	29.20	46.4	......	47.8	47.1	69	34	54.3	41.1	38	.....	38	88	74	.....	69	72	3.58	0.96
N ...	29.984	30.69	29.30	42.2	......	44.0	43.1	74	13	51.2	36.5	34	.....	35	35	74	.....	74	74	4.97	1.42
D ...	29.839	30.43	28.71	32.5	......	35.2	33.8	60	5	41.4	27.7	22	.....	25	24	67	.....	68	68	4.38	2.87
Y ...	29.883	30.70	28.71	44.7	......	46.8	46.8	96	−6	55.2	39.4	36	.....	37	37	72	.....	72	70	45.9	......

BROWNSVILLE, TEX.

[Latitude, 25° 53′ N.; longitude, 97° 26′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
J....	30.171	30.64	29.79	51.6	58.6	54.8	55.0	78	21	62.4	48.0	50	52	53	52	94	81	93	89	1.98	.96
F ...	29.982	30.44	29.68	61.4	70.8	63.6	65.3	84	46	73.4	58.2	59	60	60	60	92	70	89	84	1.09	.69
M ...	29.999	30.48	29.56	61.5	70.8	64.0	65.4	85	45	73.2	58.4	58	61	60	60	90	72	87	83	2.31	1.12
A....	29.994	30.23	29.78	70.8	79.0	72.8	74.2	84	61	81.1	68.4	68	70	70	69	92	73	90	85	4.79	1.88
M ...	29.828	30.02	29.57	74.0	83.5	76.4	78.0	88	64	84.8	72.0	72	73	73	73	93	72	90	85	1.77	1.39
J....	29.832	29.97	29.64	76.8	86.7	79.2	80.9	92	67	87.8	75.0	74	75	76	75	91	69	90	84	2.95	1.86
J....	29.950	30.05	29.81	78.7	......	84.6	81.6	94	72	90.8	76.1	76	.....	75	75	92	.....	73	82	1.30	.48
A....	29.896	30.08	29.73	78.5	......	84.0	81.2	97	73	91.2	76.5	76	.....	76	76	92	.....	78	85	.95	.46
S....	29.936	30.12	29.83	73.3	......	79.1	76.2	94	65	87.3	71.6	70	.....	72	71	91	.....	80	86	7.47	2.92
O ...	29.943	30.16	29.78	71.0	......	74.8	72.9	88	52	83.9	69.0	69	.....	70	69	92	.....	85	89	2.05	1.07
N ...	30.026	30.27	29.62	62.0	......	65.7	63.8	88	44	73.9	60.1	59	.....	61	60	91	.....	85	88	4.99	2.17
D ...	30.096	30.42	29.78	56.3	......	62.5	59.4	78	41	72.1	54.6	53	.....	56	55	90	.....	81	85	.93	.57
Y ...	29.971	30.64	29.56	68.0	......	71.8	71.2	97	21	80.2	65.7	65	.....	67	66	92	.....	85	85	32.6	......

BUFFALO, N. Y.

[Latitude, 42° 53′ N.; longitude, 78° 53′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
J ...	29.411	30.04	28.81	16.8	20.3	17.5	18.2	49	−6	25.4	11.1	12	14	12	13	83	75	81	80	2.45	.45
F ...	29.306	30.00	28.62	21.1	26.8	23.4	23.8	51	−8	32.3	15.5	16	19	18	18	81	72	79	78	1.46	.60
M ...	29.333	29.72	28.43	22.0	27.6	25.4	25.0	63	2	33.0	18.5	17	20	19	18	80	74	77	77	2.07	.50
A ...	29.375	29.81	28.84	35.6	42.2	38.7	38.8	66	21	46.1	32.0	28	28	30	29	77	61	73	70	3.46	1.64
M ...	29.232	29.63	28.84	50.4	56.7	52.6	53.2	81	33	61.8	45.7	43	43	44	43	77	64	74	72	1.66	.77
J ...	29.214	29.50	28.92	61.9	68.6	64.3	64.9	86	45	71.4	58.0	55	56	55	55	79	67	73	73	3.64	1.56
J ...	29.299	29.48	28.92	66.3	......	69.6	68.0	84	49	76.0	59.8	55	.....	57	56	68	.....	66	67	2.01	1.52
A ...	29.269	29.58	28.90	66.0	......	69.7	67.8	85	50	73.9	61.7	57	.....	59	58	72	.....	70	71	1.81	.56
S ...	29.334	29.76	28.89	56.6	......	60.0	58.3	80	36	66.8	51.2	50	.....	51	51	80	.....	74	77	3.52	1.51
O ...	29.222	29.61	28.65	43.3	......	46.7	45.0	66	31	50.9	39.3	36	.....	38	37	78	.....	74	76	5.43	1.29
N ...	29.382	29.86	28.80	39.2	......	41.1	40.2	68	15	45.7	35.6	33	.....	35	34	79	.....	79	79	3.90	1.36
D ...	29.283	29.78	28.76	29.7	......	32.1	30.9	55	4	35.6	26.1	24	.....	25	25	80	.....	78	79	2.46	.55
Y ...	29.305	30.04	28.43	42.4	......	45.1	44.5	86	−8	51.6	37.9	36	.....	37	36	78	.....	75	75	33.87	......

Monthly and yearly meteorological summaries—Continued.

BOISÉ CITY, IDAHO.

[*H*=2750. *T*=43. *h*=361.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	8 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calm.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.7	6.9	6.0	6.2	2,245	20	SE.	NW.	17	3	5	17	7	8	5	19	17	8	7	16	0	13	15	25	0	0	0	J.
3.5	4.6	3.5	3.8	2.303	24	N.	W.	10	5	12	5	3	2	18	15	17	12	13	4	0	6	0	24	0	0	0	F.
4.9	6.1	4.6	5.2	4,506	32	W.	SE.	10	4	12	20	11	7	15	11	3	7	13	11	0	7	0	21	0	0	0	M.
2.6	3.9	4.6	3.7	3,328	40	E.	W.	15	3	17	7	9	3	19	13	4	10	16	4	0	3	0	4	0	0	0	A.
3.6	4.7	4.8	4.4	3,379	26	NW.	W.	18	3	9	2	6	3	24	16	12	12	13	6	0	8	0	1	0	0	0	M.
6.2	6.5	5.9	6.2	2,253	28	W.	W.	12	0	11	3	4	2	22	7	29	3	15	12	0	10	0	0	0	0	0	J.
2.6	.....	3.0	2.8	1,643	23	W.†	W.	2	0	4	1	4	3	10	9	29	20	4	7	0	4	0	0	22	1	0	J.
1.8	.....	2.3	2.0	1,111	19	N.	W.	6	1	4	0	0	0	13	3	35	28	1	2	0	3	0	0	15	1	0	A.
2.9	....	2.0	2.4	1,908	18	SE.	W.	4	1	6	4	1	1	20	3	20	19	8	3	0	1	0	0	10	0	0	S.
4.8	....	5.6	5.2	2,092	22	SE.	W.	11	1	3	7	1	1	14	4	20	11	5	15	0	6	0	5	0	0	0	O.
5.3	....	5.7	5.5	1,797	18	E.	W.	4	1	5	5	1	6	14	2	22	8	11	11	0	9	0	24	0	0	0	N.
4.8	.....	5.4	5.1	2,362	26	SE.	E., SE.	4	2	9	9	8	1	1	5	23	5	12	14	0	9	1	20	0	0	0	D.
4.1	.....	4.4	4.4	28,927	.....	....	W.	113	24	97	80	55	32	175	107	231	143	118	105	0	79	16	124	47	2		Y.

BOSTON, MASS.

[*H*=124. *T*=116. *h*=174.]

5.1	4.9	3.1	4.4	10,417	52	NW.	W.	6	2	2	3	4	4	42	30	0	12	12	7	0	11	20	31	0	0	0	J.
5.4	4.6	4.6	4.8	7,520	42	E.†	W.	16	4	5	6	3	10	24	19	0	10	9	10	0	10	8	26	0	0	0	F.
5.0	6.6	5.6	5.7	11,433	60	E.†	W.	9	9	5	4	4	14	36	12	0	9	9	13	0	11	4	21	0	0	0	M.
4.1	5.3	3.5	4.4	8,205	42	W.	W.	12	2	13	3	3	7	34	16	0	12	11	7	0	13	0	7	0	1	1	A.
6.8	7.4	6.6	6.9	6,884	28	E.	E.	11	10	24	4	8	12	10	14	0	4	11	16	0	18	0	0	0	1	1	M.
4.3	6.0	3.9	4.7	7,381	36	W.†	W.	5	8	9	9	4	23	24	8	0	8	13	9	0	12	0	0	1	4	0	J.
3.8	.....	6.1	5.0	8,027	42	W.	W.	8	10	1	7	4	12	17	3	0	10	11	10	0	9	0	0	0	2	0	J.
5.4	.....	4.4	4.9	8,435	45	E.	W.	8	4	6	1	6	8	25	4	0	10	13	8	0	11	0	0	0	0	0	A.
6.0	.....	4.6	5.3	6,899	60	N.	N.	12	5	4	10	7	5	10	7	0	8	7	15	0	17	0	0	0	0	0	S.
6.3	.....	5.0	5.6	8,301	37	W.	NW.	8	3	5	6	3	10	13	14	0	7	9	15	0	13	0	0	0	0	0	O.
5.9	.....	5.7	5.8	10,060	60	NE.	SW.	6	9	3	0	1	15	13	13	0	8	9	13	0	14	2	8	0	0	0	N.
6.3	.....	3.9	5.1	10,510	48	SW.	W.	3	1	2	1	3	21	22	9	0	9	11	11	0	8	6	20	0	0	0	D.
5.4	.....	4.8	5.2	104,072	.....	....	W.	104	67	79	54	50	141	270	149	0	107	125	134	0	147	40	113	1	8	2	Y.

BROWNSVILLE, TEX.

[*H*=57. *T*=17. *h*=34.]

7.7	8.0	8.2	8.0	6,436	34	N.	N.	46	5	13	3	22	0	1	3	0	3	9	19	0	17	1	3	0	0	0	J.
6.3	5.5	4.7	5.5	5,948	36	S.	S.	25	8	10	5	34	1	1	2	1	8	11	10	0	4	0	0	0	1	0	F.
6.5	7.0	4.8	6.1	7,405	38	S.	S.	24	12	17	8	26	2	1	3	0	6	12	13	0	8	0	0	0	4	0	M.
6.1	5.8	4.4	5.4	7,294	37	NE.	S.	7	3	22	25	29	3	0	1	0	1	25	4	0	9	0	0	0	4	0	A.
4.8	4.7	4.0	4.5	6,763	34	S.	S.	6	6	16	16	42	2	1	3	1	9	19	5	0	6	0	0	0	2	0	M.
3.2	4.8	3.4	3.8	5,094	26	W.	S.	2	7	17	29	30	2	0	2	1	14	10	6	0	12	0	0	4	0	0	J.
1.7	.....	2.3	2.0	5,429	24	E.†	SE.	2	5	10	26	18	1	0	0	0	18	13	0	0	5	0	0	26	4	0	J.
2.2	.....	3.6	2.9	5,636	35	S.	SE.	4	6	9	25	15	0	0	2	1	13	18	0	0	7	0	0	23	4	0	A.
3.8	....	5.7	4.8	4,681	25	N.	N.	26	9	18	6	1	0	0	0	0	12	7	11	0	14	0	0	5	4	0	S.
3.9	.....	2.6	3.2	5,657	26	S.	S.	11	6	12	13	14	0	1	5	0	19	7	5	0	10	0	0	0	0	0	O.
6.2	.....	5.1	5.6	5,993	26	NW.	N.	25	1	1	8	14	1	1	8	1	12	7	11	0	14	0	0	0	2	0	N
5.0	.....	2.5	3.8	6,698	38	S.	N.	17	2	13	7	16	0	2	5	0	15	10	6	0	7	0	0	0	1	0	D.
4.8	.....	4.3	4.6	73,034	.....	.. ..	S.	195	70	158	171	261	12	8	34	5	130	148	88	0	113	1	3	58	26	0	Y.

BUFFALO, N. Y.

[*H*=690. *T*=103. *h*=93.]

7.9	7.0	6.4	7.1	9,634	60	SW.	W.	5	11	6	4	7	17	35	6	2	3	14	14	0	21	26	31	0	0	0	J.
6.8	8.0	5.4	6.8	8,173	52	SW.	SW.	1	8	10	3	14	28	16	5	2	2	17	10	0	13	10	27	0	0	0	F.
7.0	8.1	5.7	6.9	9,264	42	SW.	SW.	2	8	6	4	7	30	25	11	0	3	12	16	0	17	13	28	0	0	0	M.
3.2	5.8	3.6	4.2	7,212	45	SW.	SW.	4	9	4	3	7	38	17	8	0	13	12	5	0	13	0	18	0	2	1	A.
5.9	7.3	4.6	5.9	6,496	42	S.	SW.	3	9	12	13	9	30	10	6	1	5	20	6	0	19	0	0	0	2	1	M.
4.9	5.6	3.0	4.5	6,479	42	SW.	SW.	1	11	2	1	8	50	7	5	5	12	12	6	0	9	0	0	0	6	0	J.
3.9	.....	4.1	4.0	6,517	48	SW.	SW.	2	10	3	0	7	23	10	7	0	9	16	6	0	6	0	0	0	3	0	J.
5.8	.....	3.6	4.7	7,655	45	W.	SW.	9	5	4	0	6	32	3	2	1	7	14	10	0	8	0	0	0	3	0	A.
5.5	.....	4.0	4.8	5,820	46	SW.	SW.	7	6	5	3	10	14	10	4	1	6	14	10	0	12	0	0	0	1	0	S.
8.5	.....	5.5	7.0	8,642	41	SW.	W.	5	6	3	5	12	6	17	8	0	2	7	22	0	20	0	1	0	1	0	O.
8.4	.....	5.6	7.0	8,351	58	SW.	W.	5	10	3	1	13	8	17	3	0	3	10	17	0	15	4	10	0	0	0	N.
7.7	.....	7.5	7.6	10,786	50	SW.	SW.	3	3	0	2	14	19	18	3	0	1	7	23	0	15	9	23	0	0	0	D.
6.3	.....	4.9	5.9	95,029	.....	....	SW.	47	96	58	39	114	295	185	68	12	66	155	145	0	168	62	138	0	18	2	Y.

Monthly and yearly meteorological summaries—Continued.

FORT BUFORD, DAK.

[Latitude, 48° N.; longitude, 103° 56′ W.]

Months and year.	Pressure.			Temperature.								Dew Point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	8 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	8 p. m.	10 p. m.	Mean.	7 a. m.	8 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
	In.	*In.*	*In.*	°	°	°	°	°	°	°	°	°	°	°	°					*In.*	*In.*
J ...	28.079	28.47	27.52	-11.5	-0.2	-5.1	-5.6	42	-49	4.2	-17.9	-16	- 6	-10	-10	84	79	82	82	.47	.36
F ...	27.967	28.59	27.43	6.7	15.9	12.8	11.8	49	-28	25.6	0.7	2	10	9	7	84	77	83	81	.33	.14
M ...	28.025	28.47	27.45	6.7	19.2	13.5	13.1	51	-28	26.6	2.0	4	12	9	9	89	77	84	83	.44	.18
A ...	27.991	28.63	27.37	32.4	49.0	42.6	41.3	82	4	54.7	29.5	27	31	30	29	81	54	65	67	.61	.39
M ...	27.935	28.33	27.48	40.7	58.2	51.6	50.2	75	22	61.5	37.7	32	32	34	33	73	41	54	56	.96	.54
J ...	27.747	28.09	27.14	54.4	70.1	65.1	63.2	100	36	74.0	51.2	48	50	52	50	81	54	66	67	6.75	1.89
J ...	27.972	28.19	27.67	61.2	....	76.4	68.8	95	49	81.8	56.4	55	.. ..	55	55	79	.....	49	64	2.12	.44
A ...	27.991	28.23	27.75	55.5	....	72.3	63.9	96	36	77.0	50.9	50	.....	50	50	83	.....	48	66	1.61	.82
S ...	28.002	28.33	27.64	47.1	....	66.6	56.8	93	25	74.1	44.7	38	.....	40	39	72	.....	40	56	.62	.38
O ..	27.897	28.20	27.29	36.2	....	46.9	41.6	76	22	55.2	32.3	30	.....	32	31	82	.....	60	71	.62	.20
N ...	28.004	28.43	27.51	19.3	....	29.9	24.6	54	1	39.7	15.5	16	.....	21	19	89	.....	71	80	.10	.04
D ...	27.954	28.40	27.48	16.3	....	24.0	20.2	58	- 9	32.9	11.0	13	.....	17	15	88	.....	77	83	.07	.05
Y ...	27.964	28.63	27.14	30.4	....	41.4	37.5	100	-49	50.6	26.0	25	.....	28	27	82	.....	65	71	14.7	....

CAIRO, ILL.

[Latitude, 37° 0′ N.; longitude, 87° 10′ W.]

J.....	29.887	30.44	59.51	27.5	34.8	32.9	31.7	73	0	40.5	24.5	22	25	24	24	78	70	72	73	2.80	1.04
F....	29.713	30.32	29.10	32.7	41.0	38.7	37.5	66	10	45.4	29.9	27	30	28	28	79	67	70	72	2.51	1.28
M ...	29.727	30.14	29.19	39.5	49.9	45.3	44.9	76	21	53.0	36.5	32	36	35	34	74	62	69	69	4.91	1.50
A....	29.755	30.06	29.29	53.8	68.3	62.0	61.4	82	40	71.3	52.5	41	42	43	42	63	40	52	52	3.08	1.20
M ...	29.555	29.78	29.30	58.0	71.2	64.7	64.6	84	42	72.3	56.6	52	52	54	53	82	54	71	69	3.58	.96
J.....	29.584	29.81	29.30	68.2	78.6	72.0	72.9	89	51	80.5	66.2	64	64	65	64	86	63	79	76	5.48	1.42
J.....	29.658	29.80	29.50	75.9	....	83.2	79.5	95	65	88.2	71.9	69	.....	70	69	79	.....	65	72	3.32	2.04
A....	29.646	29.88	29.35	71.5	....	77.4	74.4	97	58	83.7	68.3	66	.....	68	67	84	....	74	79	5.45	1.36
S.....	29.693	30.05	29.47	61.8	....	68.4	64.8	88	42	76.5	58.4	56	.....	58	57	83	.....	70	76	.28	.13
O....	29.658	29.89	29.32	49.2	....	58.0	53.6	82	36	64.8	46.9	44	.....	45	44	82	.....	64	73	3.24	1.14
N....	29.764	30.08	29.24	42.8	....	48.2	45.5	78	28	53.1	40.3	38	.....	39	38	84	.....	72	78	4.85	1.75
D....	29.792	30.10	29.28	35.5	.. ..	41.1	38.3	62	20	45.9	33.0	30	.....	31	30	81	.....	69	75	2.40	.98
Y....	29.703	30.44	29.10	51.3	....	57.7	55.8	97	0	64.6	48.8	45	.....	47	46	80	......	69	72	41.9	....

FORT CANBY, WASH.

[Latitude, 46° 16′ N.; longitude, 124° 4′ W.]

J......	29.781	30.48	29.19	32.7	37.6	36.3	35.5	55	11	40.7	30.8	30	33	33	32	92	84	87	88	11.39	2.19
F ...	29.924	30.34	29.17	40.6	45.1	44.3	43.3	56	35	47.7	39.4	39	42	42	41	94	90	91	92	3.69	0.48
M...	29.798	30.22	29.26	41.3	45.7	44.7	43.9	57	32	48.5	40.0	38	40	39	39	89	82	82	84	6.58	2.40
A ...	29.924	30.15	29.52	45.6	52.6	49.1	49.1	64	40	54.8	44.3	42	45	43	43	88	75	82	82	3.53	0.78
M...	29.791	30.07	29.51	48.9	57.5	53.0	53.1	78	43	60.2	47.3	44	47	46	46	85	70	78	78	0.49	0.18
J.....	29.689	30.05	29.18	55.2	60.4	57.6	57.7	72	50	63.2	53.3	52	54	52	53	88	79	83	84	5.66	1.27
J.....	29.882	30.20	29.62	57.4	....	61.0	59.2	83	52	65.1	54.7	53	.....	54	53	86	.....	78	82	1.92	0.77
A ...	29.856	30.12	29.62	56.6	....	60.9	58.8	68	50	64.1	54.9	55	.....	56	55	94	.....	85	89	0.93	0.42
S.....	29.826	30.12	29.53	57.6	....	60.3	59.0	84	50	64.7	54.8	55	.....	55	55	92	.....	85	88	2.14	1.35
O ...	29.827	30.20	29.53	54.1	....	56.4	55.2	67	41	58.7	50.9	52	.....	51	52	95	.....	84	90	6.89	1.27
N ...	29.831	30.13	29.51	46.3	....	48.6	47.4	55	36	50.0	43.3	42	.....	42	42	87	.....	82	84	8.43	2.70
D ...	29.730	30.14	29.23	46.6	....	48.1	47.4	55	36	49.7	43.3	41	.....	42	42	84	.....	82	83	8.13	2.25
Y ...	29.822	30.48	29.17	48.6	....	51.7	50.8	84	11	55.6	46.4	45	.....	46	46	89	.....	83	85	59.8	....

CARSON CITY, NEV.

[Latitude, 39° 8′ N.; longitude, 119° 47′ W.]

J.....	....	....	....	21.3	32.2	29.4	27.6	58	-10	37.6	16.8	12	16	16	14	68	52	57	59	1.51	.96
F ..	....	....	....	31.9	45.9	43.1	40.3	63	17	51.3	28.0	22	24	24	23	66	42	47	52	.17	.17
M....	....	....	....	32.3	48.7	44.8	41.9	66	17	53.4	29.0	20	20	20	20	60	34	40	45	.50	.22
A ...	....	....	....	39.5	63.1	58.7	53.8	82	21	68.0	36.0	27	23	26	25	61	24	30	38	.18	.18
M...	....	....	....	44.2	64.6	59.5	56.1	84	31	69.3	41.8	32	28	32	30	63	27	37	42	1.11	.84
J.....	....	....	....	50.5	68.0	64.0	60.8	83	37	72.5	47.4	32	30	31	31	52	26	31	36	.07	.05
J.....	....	....	....	53.5	....	79.4	66.4	94	38	84.7	51.5	35	.....	35	35	51	.....	22	36	.25	.13
A ...	....	....	....	54.7	....	81.3	68.0	90	42	85.2	49.0	41	.....	39	40	61	.....	24	42	.02	.02
S.....	....	....	....	54.6	....	74.9	64.8	89	41	81.1	50.2	43	.....	42	42	67	.....	34	50	.53	.32
O ...	....	....	....	40.3	....	62.1	51.2	80	22	67.9	36.8	32	....	33	32	72	.....	35	54	T.	T.
N ...	....	....	....	31.5	....	45.8	38.6	68	16	51.4	28.6	26	.....	33	30	81	.....	64	72	1.75	1.01
D ...	....	....	....	32.0	....	42.8	37.4	58	22	48.5	28.5	26	.....	32	29	80	.....	67	74	.56	.24
Y ...	....	....	....	40.5	....	57.2	50.6	94	-10	64.2	37.0	29	.....	30	29	65	.....	41	50	6.65	....

Monthly and yearly meteorological summaries—Continued.

FORT BUFORD, DAK.

[*H*=1,900. *T*=17. *h*=8.]

Cloudiness (in tenths).				Wind.													Number of days.											
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles.)	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
3.6	6.2	3.9	6.4	6,052	48	NW.	NW.†	4	7	9	4	9	18	20	20	2	8	19	4	0	6	25	31	0	0	5	J.
6.2	7.3	6.0	6.5	6,125	46	W.	NW.	7	8	21	3	8	12	10	23	0	4	12	13	0	9	17	29	0	0	3	F.
5.8	6.1	4.5	5.5	7,076	46	NW.	NW.	10	10	21	4	9	4	8	25	2	5	19	7	0	7	18	31	0	0	2	M.
7.3	5.3	4.4	5.7	7,679	48	NW.	E.	12	13	23	10	2	5	9	16	0	4	17	9	0	5	1	17	0	1	1	A.
6.4	6.8	6.1	6.4	6,566	36	E.†	E.	10	15	31	15	5	2	8	11	1	4	15	12	0	10	0	3	0	1	1	M.
7.1	6.9	7.4	7.1	7,699	46	W.	E.	11	7	19	14	6	0	16	16	1	2	15	13	0	17	0	0	8	6	0	J.
5.4	.....	4.7	5.0	6,043	54	NW.	NW.†	9	0	13	8	6	6	7	13	0	6	16	9	0	14	0	0	4	9	0	J.
5.7	.....	4.7	5.2	5,096	30	NW.	NW.†	5	7	13	8	5	6	4	13	1	9	9	13	0	12	0	0	4	4	0	A.
4.4	.....	4.8	4.6	6,462	42	NW.	NW.	7	2	13	6	2	4	4	21	1	10	14	6	0	5	0	2	1	1	2	S.
6.4	.....	5.5	6.0	6,969	60	NW.	NW.	2	4	11	5	9	4	8	17	2	3	14	14	0	9	0	18	0	0	1	O.
4.7	.....	3.7	4.2	4,233	36	NW.	W.	5	2	8	7	9	8	11	10	0	13	10	7	0	4	6	29	0	0	1	N.
4.7	.....	4.0	4.4	5,003	42	NW.	NW.†	6	2	7	8	3	14	13	14	0	8	15	8	0	3	15	31	0	0	2	D.
5.6	.....	5.0	5.4	75,003	.....	....	NW.	88	77	189	87	68	83	113	199	10	76	175	115	0	101	82	191	12	22	18	Y.

CAIRO, ILL.

[*H*=359. *T*=88. *h*=78.]

Cloudiness (in tenths).				Wind.													Number of days.											
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles.)	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.6	6.2	5.2	5.6	7,190	36	N.†	N.	33	8	6	2	6	15	7	16	0	9	11	11	0	14	10	23	0	0	0	J.
6.2	6.9	5.1	6.1	6,742	40	S.	N.	28	8	5	6	9	5	16	10	0	6	13	10	0	9	4	15	0	2	0	F.
6.0	5.9	5.6	5.8	7,410	30	SE.†	N.	16	8	12	10	12	5	14	15	1	10	5	16	0	12	1	10	0	2	0	M.
3.5	4.5	3.0	3.7	7,681	36	SW.†	N.	20	13	6	9	12	10	10	10	0	13	12	5	0	7	0	0	0	4	0	A.
6.3	6.8	4.5	5.8	5,571	36	SW.	NE.	6	18	9	8	6	11	16	14	5	5	16	10	0	13	0	0	0	9	0	M.
6.6	7.0	4.7	6.1	4,757	40	NW.	S.	13	7	6	7	24	10	11	8	4	5	13	12	0	18	0	0	0	14	0	J.
4.9	.....	3.9	4.4	3,789	48	SW.	N.	23	6	1	0	3	14	3	8	4	3	18	10	0	6	0	0	10	7	0	J.
5.9	.....	6.2	6.0	4,539	45	W.	N.	18	17	0	0	12	6	5	3	1	3	12	16	0	15	0	0	5	10	0	A.
2.9	.....	2.7	2.8	4,452	24	SW.†	N.	19	7	1	0	5	3	9	10	6	12	12	6	0	5	0	0	0	1	0	S.
5.1	.....	4.4	4.8	5,173	30	SW.†	N.	14	5	4	2	9	6	11	8	8	8	8	15	0	14	0	0	0	1	0	O.
6.3	.....	5.9	6.1	6,034	34	NW.	N.	27	4	2	4	8	3	8	4	0	8	6	16	0	11	0	4	0	1	0	N.
5.6	.....	4.7	5.2	5,844	36	W.	N.	15	2	2	5	11	6	13	8	0	8	7	16	0	8	2	14	0	0	0	D.
5.4	.....	4.7	5.2	69,182	.....	....	N.	232	103	54	53	117	94	123	114	24	90	133	143	0	132	17	66	15	51	0	Y.

FORT CANBY, WASH.

[*H*=179. *T*=10. *h*=2.]

Cloudiness (in tenths).				Wind.													Number of days.											
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles.)	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.5	7.0	6.1	6.2	13,772	72	S.	SE.	8	10	1	43	18	2	8	3	0	7	10	14	0	20	7	15	0	0	0	J.
6.3	6.6	6.3	6.4	6,568	81	S.	SE.	13	6	1	28	10	5	10	7	7	5	10	14	0	15	0	0	0	0	0	F.
6.2	6.1	7.1	6.5	10,773	63	S.	SE.	11	1	2	26	13	6	17	17	0	6	13	12	0	17	0	1	0	0	0	M.
5.2	6.0	7.0	6.1	8,454	54	S.	S.	15	2	0	10	29	6	15	11	2	4	16	10	0	16	0	0	0	0	0	A.
6.0	5.0	5.8	5.6	6,877	36	S.	NW.	25	1	2	4	11	2	17	31	0	10	7	14	0	9	0	0	0	0	0	M.
7.2	7.6	7.8	7.5	9,334	60	SE.	S.	7	0	0	6	41	7	20	9	0	1	11	18	0	18	0	0	0	0	0	J.
6.2	.....	4.5	5.4	6,525	48	S.	N.	20	1	0	0	8	3	12	15	3	12	7	12	0	9	0	0	0	0	0	J.
3.8	.....	4.0	3.9	5,033	39	S.	N.	21	3	0	1	6	3	7	11	10	9	8	14	4	5	0	0	0	0	0	A.
4.0	.....	3.9	4.0	6,533	48	S.	N.	20	2	0	3	19	2	1	3	10	8	9	13	3	10	0	0	0	1	0	S.
6.1	.....	7.7	6.9	7,827	54	SE.	S.	8	1	2	13	14	6	9	2	7	2	9	20	0	22	0	0	0	0	0	O.
5.4	.....	6.5	6.0	10,186	54	S.	SE.	4	3	5	24	11	0	6	3	4	5	5	20	2	19	0	0	0	0	0	N.
6.4	.....	7.2	6.8	13,764	72	SE.	SE.	4	3	3	34	10	1	2	0	5	6	6	19	0	17	0	0	0	0	0	D.
5.7	.....	6.2	5.9	105,646	.....	....	SE.	156	33	16	192	190	43	124	112	48	75	111	180	9	177	7	16	0	1	0	Y.

CARSON CITY, NEV.

[*H*=.... *T*=21. *h*=42.]

Cloudiness (in tenths).				Wind.													Number of days.											
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles.)	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
4.6	4.7	4.0	4.4	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11	14	6	0	9	10	22	0	0	0	J.
3.0	3.6	1.8	2.6	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	18	8	3	0	1	0	24	0	0	0	F.
2.7	3.1	3.1	3.0	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	19	10	2	0	5	0	21	0	0	0	M.
1.1	1.8	1.0	1.1	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	25	5	0	0	1	0	8	0	1	1	A.
2.2	3.5	3.0	2.9	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	19	10	2	0	7	0	1	0	5	0	M.
2.2	2.7	3.9	3.0	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	19	7	4	0	3	0	0	0	0	0	J.
1.5	.....	2.6	2.0	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	21	8	2	0	4	0	0	2	2	0	J.
.8	.....	2.4	1.6	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	26	4	1	0	1	0	0	1	3	0	O.
1.7	.....	4.5	3.1	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	19	8	3	0	5	0	0	0	5	0	N.
2.4	.....	3.8	3.1	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	23	5	3	0	0	0	8	0	0	0	D.
3.0	.....	5.2	4.1	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13	6	11	0	8	0	20	0	0	0	
4.8	.....	6.4	5.6	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11	4	16	0	6	0	24	0	0	0	
2.5	.....	3.4	3.0	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	224	89	53	0	50	10	128	3	16	1	

Monthly and yearly meteorological summaries—Continued.

CEDAR KEYS, FLA.

[Latitude, 29° 8′ N; longitude, 83° 3′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Mean.		7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	8 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
										Maximum.	Minimum.										
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J.....	30.221	30.37	29.96	54.4	64.3	59.1	59.3	77	29	66.5	52.6	50	52	52	51	84	69	79	78	0.77	0.51
F.....	30.082	30.44	29.85	58.2	65.3	61.4	61.6	73	33	68.0	55.9	55	57	56	56	89	75	83	82	3.78	2.36
M ...	30.127	30.46	29.82	56.9	65.8	61.4	61.4	74	37	67.8	55.2	51	52	52	52	82	63	74	73	0.94	0.63
A*..	30.147	30.40	29.96	67.1	75.1	69.6	70.6	81	55	76.9	64.7	60	62	61	61	81	65	76	74	0.09	0.08
M ...	29.966	30.16	29.73	73.2	78.4	74.2	75.3	86	63	81.0	70.3	67	66	67	66	80	66	78	75	1.70	0.74
J.....	30.000	30.25	29.84	77.6	83.5	79.3	80.1	89	66	85.7	74.8	71	70	70	70	79	66	75	73	4.86	2.20
J.....	30.030	30.18	29.92	80.5	....	81.1	80.8	91	71	88.2	76.3	74	.....	73	73	80	.....	78	79	4.11	1.30
A....	30.040	30.18	29.92	80.6	....	81.2	80.9	91	71	86.1	76.1	75	.....	74	74	82	.....	78	80	2.26	0.75
S†...	29.972	30.21	29.76	74.5	....	76.3	75.4	91	55	83.5	70.8	70	.....	70	70	86	.....	82	84	12.89	2.92
O....	30.024	30.24	29.44	67.7	....	72.2	70.0	83	56	77.3	65.8	62	....	65	63	83	.....	79	81	2.43	1.46
N....	30.079	30.27	29.78	59.5	....	64.2	61.8	83	43	69.2	57.7	56	.....	59	57	87	.....	83	85	5.43	2.89
D....	30.155	30.42	29.71	51.1	....	56.1	53.6	70	32	60.7	49.1	46	.....	50	48	84	.....	80	82	3.87	1.86
Y....	30.070	30.46	29.44	66.8	....	69.7	69.2	91	29	75.9	64.1	61	.....	62	62	83	.....	79	79	43.13	....

* One 8 p. m. observation missed.

CHARLESTON, S. C.

[Latitude, 32° 47′ N.; longtitude, 79° 56 W.]

J.....	30.193	30.58	29.86	46.5	56.5	49.9	51.0	76	26	60.0	42.6	43	45	44	44	87	70	83	80	1.95	1.19
F ...	30.049	30.52	29.68	49.4	59.1	53.4	54.0	72	28	62.5	47.1	45	49	49	48	87	71	87	81	3.64	1.08
M ...	30.082	30.45	29.63	50.0	61.1	54.6	55.2	74	30	64.0	46.9	44	46	48	46	82	62	79	74	3.64	1.18
A ...	30.114	30.51	29.76	61.2	71.3	64.2	65.6	88	50	74.7	58.9	56	56	60	57	83	60	85	76	1.88	.72
M ...	29.944	30.21	29.75	70.2	76.1	70.7	72.3	87	52	79.4	67.0	65	64	67	66	85	70	88	81	5.82	2.67
J.....	29.957	30.29	29.70	76.2	82.2	76.1	78.2	95	62	86.5	71.8	70	69	71	70	81	66	84	77	3.14	1.29
J.....	30.008	30.21	29.79	78.4	....	78.6	78.5	100	68	87.1	73.3	71	.....	72	72	79	.....	81	80	6.06	4.27
A....	30.034	30.18	29.88	79.8	....	79.6	79.7	96	67	87.9	74.9	73	......	74	74	81	......	83	82	4.01	1.48
S......	29.986	30.24	29.72	73.2	....	74.8	74.0	89	50	81.2	69.4	68	......	68	68	83	......	81	82	5.33	1.65
O....	30.006	30.27	29.32	62.7	....	65.8	64.2	81	50	73.2	58.7	56	.....	59	58	79	......	81	80	4.83	2.40
N....	30.061	30.34	29.76	54.9	....	57.7	56.3	80	36	64.4	51.0	51	......	52	52	88	.....	83	86	7.54	3.92
D....	30.122	30.51	29.53	44.9	....	49.4	47.2	68	28	56.4	41.9	40	.....	42	41	84	......	75	80	2.12	1.06
Y....	30.046	30.53	29.32	62.3	....	64.6	64.7	100	26	73.1	58.6	57	.....	59	58	83	.....	82	80	49.5	......

CHARLOTTE, N. C.

[Latitude, 35° 13′ N.; longitude, 80° 51′ W.]

J.....	29.367	29.78	28.99	37.0	47.5	41.4	42.0	73	17	52.7	32.9	31	34	32	32	80	64	73	72	4.38	1.37
F....	29.241	29.74	28.80	40.6	52.2	45.5	46.1	70	16	55.6	37.5	36	37	37	37	84	61	74	73	4.26	2.05
M ...	29.255	29.61	28.74	42.8	56.7	48.3	49.3	79	20	60.9	38.5	33	32	34	33	71	46	60	59	6.22	1.64
A ...	29.306	29.76	28.92	56.0	72.3	61.3	63.2	91	37	75.5	50.9	43	40	43	42	64	35	55	52	2.36	1.37
M ...	29.150	29.45	28.94	63.0	73.5	65.3	67.3	94	40	79.3	58.3	57	56	57	57	82	58	79	73	5.64	1.18
J.....	29.166	29.50	28.95	71.5	84.6	74.8	77.0	98	55	88.0	66.5	64	62	64	63	77	48	70	65	1.66	.73
J.....	29.238	29.42	29.03	74.8	....	80.2	77.5	100	60	90.1	67.9	65	.....	65	65	72	.....	62	67	1.68	.64
A ...	29.249	29.42	29.01	74.5	....	76.9	75.7	100	55	90.0	68.1	67	.....	67	67	79	.....	73	76	6.93	2.11
S.....	29.238	29.48	28.96	63.8	....	67.6	65.7	88	38	77.4	60.5	61	.....	63	62	90	.....	86	88	8.25	3.41
O....	29.215	29.55	28.67	51.6	....	57.0	54.3	78	37	67.5	47.1	47	.....	50	49	84	.....	80	82	5.87	2.58
N ...	29.300	29.66	28.91	45.7	....	52.1	48.9	78	30	60.7	43.3	40	.....	44	42	82	.....	75	78	1.69	.56
D....	29.304	29.73	28.65	35.9	....	43.8	39.8	68	20	51.9	33.7	29	.....	34	32	76	.....	71	74	3.67	1.30
Y ...	29.252	29.78	28.65	54.8	....	59.5	58.9	100	16	70.8	50.4	48	.....	49	48	78	.....	72	72	52.6	....

CHATTANOOGA, TENN.

[Latitude 35° 4′ N.; longitude 85° 15′ W.]

J.....	29.430	29.71	28.97	38.1	46.5	41.8	42.1	73	13	50.7	34.4	34	37	36	36	86	73	82	80	6.79	2.18
F....	29.272	29.73	28.72	40.7	52.3	47.4	46.8	68	10	56.1	38.8	36	40	40	38	84	65	76	75	4.92	1.67
M ...	29.307	29.65	28.68	41.9	56.4	49.6	49.3	80	22	59.6	39.8	37	38	40	38	83	55	70	69	6.86	3.29
A....	29.327	29.73	29.01	54.9	72.5	63.3	63.6	84	40	76.6	52.3	47	47	48	47	76	43	60	60	4.43	1.40
M ...	29.149	29.39	28.95	60.5	73.8	66.3	66.9	88	40	85.6	58.0	57	60	60	59	90	65	80	78	4.91	2.60
J.....	29.180	29.49	28.82	68.8	81.7	73.2	74.6	94	52	85.6	65.2	65	64	66	65	86	58	80	75	3.31	2.13
J.....	29.241	29.38	29.11	75.1	....	81.0	78.0	96	66	89.6	70.2	69	.....	70	69	80	.....	70	75	2.07	1.49
A....	29.244	29.43	28.91	73.0	....	78.8	75.9	98	58	87.7	68.1	68	.....	69	68	83	.....	74	78	5.34	1.42
S.....	29.246	29.51	29.05	63.1	....	68.5	65.8	87	38	77.8	59.4	60	.....	62	61	90	.....	80	85	4.12	1.10
O.....	29.238	29.52	28.88	51.0	....	59.3	55.2	82	37	67.5	47.1	46	.....	51	49	85	.....	76	81	5.17	2.51
N ...	29.317	29.58	28.96	47.4	....	53.7	50.6	78	27	61.9	44.1	42	.....	44	43	83	.....	71	77	4.66	2.74
D,...	29.357	29.68	28.78	37.0	....	44.7	40.8	65	20	52.6	33.6	30	.....	33	32	78	.....	66	72	1.99	0.94
Y ...	29.276	29.73	28.68	54.3	....	60.6	59.1	98	10	70.1	50.9	50	.....	52	50	84	.....	74	75	54.9	....

***Monthly and yearly meteorological summaries*—Continued.**

CEDAR KEYS, FLA.

[*H*=22. *T*=41. *h*=33.]

Cloudiness. (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
4.5	5.2	2.7	4.2	5,463	36	NW.	NE.	11	19	10	10	17	5	8	12	1	11	15	5	0	6	0	1	0	0	0	J.
4.7	6.1	3.7	4.8	6,562	32	W.	S.	4	14	7	7	25	7	14	9	0	9	12	8	0	11	0	0	0	8	0	F.
5.4	4.5	3.7	4.6	7,926	36	S.	S.	5	11	15	11	18	2	12	17	2	9	17	5	0	7	0	0	0	0	0	M.
4.6	3.5	2.1	3.4	6,146	26	E.	W.	5	16	6	2	6	15	29	8	3	12	17	1	0	2	0	0	0	4	0	A.
4.2	4.9	3.4	4.2	6,632	37	W.	W.	3	10	7	6	14	14	30	6	8	11	16	4	0	11	0	0	0	15	0	M.
4.4	4.3	3.0	3.9	5,798	35	NE.	W.	7	10	7	5	6	9	23	22	1	13	14	3	0	9	0	0	0	2	0	J.
3.9	.....	6.3	5.1	5,001	37	N.	NE.	4	18	12	1	3	0	8	10	6	8	14	9	0	13	0	0	2	12	0	J.
4.3	.....	6.6	5.4	6,079	44	SE.	SE.†	8	12	9	12	3	6	3	8	1	6	13	12	0	12	0	0	4	9	0	A.
6.1	.....	5.5	5.8	7,498	60	NE.	NE.	12	22	6	6	6	2	1	4	1	6	9	15	0	16	0	0	2	5	0	S.
4.1	.....	2.1	3.1	6,069	75	S.	NW.†	7	17	10	1	4	2	3	17	1	21	1	9	0	8	0	0	0	0	0	O.
5.7	.....	4.9	5.3	7,857	30	N.	NE.	13	26	3	3	4	1	0	10	0	11	6	13	0	12	0	0	0	0	0	N.
4.3	.....	3.5	3.9	7,430	36	NW.†	NE.	18	20	8	1	1	0	2	12	0	16	6	9	0	10	0	1	0	1	0	D.
4.7	.....	4.0	4.5	78,461	.....	....	NE.	97	195	100	65	107	63	133	135	19	133	140	93	0	117	0	2	8	56	0	Y.

CHARLESTON, S. C.

[*H*=52. *T*=60. *h*=55.]

4.2	5.5	4.0	4.6	5,861	32	NE.	W.	8	15	5	1	2	20	22	13	7	14	8	9	1	8	0	1	0	1	0	J.
6.4	5.8	4.3	5.5	5,288	26	NE.	SW.	13	8	13	6	4	18	16	6	3	8	12	9	0	12	0	2	0	1	0	F.
5.1	4.9	3.4	4.4	7,187	36	SW.	SW.	8	5	9	8	8	24	11	20	0	11	12	8	0	9	0	1	0	0	0	M.
4.0	4.1	3.1	3.7	7,105	36	NE.	SW.	4	13	18	6	5	24	7	5	8	15	10	5	0	8	0	0	0	2	0	A.
5.3	6.4	4.7	5.5	7,335	36	SE.	SW.	5	2	10	12	10	41	8	3	2	5	18	8	0	12	0	0	0	2	0	M.
4.9	5.4	5.6	5.3	5,865	27	W.	SW.	2	7	9	9	3	43	13	3	1	8	13	9	0	12	0	0	6	8	0	J.
5.4	.....	5.7	5.6	6,263	35	SE.	SW.	7	6	10	10	3	17	6	2	1	13	13	5	0	10	0	0	8	6	0	J.
6.1	.....	5.0	5.6	5,684	25	W.†	SW.	6	8	11	3	9	15	9	1	0	11	9	11	0	13	0	0	9	8	0	A.
6.9	.....	4.9	5.9	6,227	36	S.	N.	12	10	9	3	7	10	4	5	0	9	11	10	0	15	0	0	0	1	0	S.
4.3	.....	3.4	3.8	6,023	48	NE.	SW.	6	12	8	3	3	13	12	5	0	15	7	9	0	13	0	0	0	0	0	O.
6.5	.....	4.3	5.4	6,896	46	E.	W.†	14	14	2	6	2	5	14	3	0	9	5	16	0	9	0	0	0	1	0	N.
3.6	.....	4.2	3.9	5,702	50	SE.	NE.	13	15	6	1	4	2	11	8	2	16	2	13	0	9	0	2	0	0	0	D.
5.2	.....	4.4	4.9	75,436	.....	....	SW.	98	115	110	68	60	232	133	74	24	134	120	112	1	130	0	6	23	30	0	Y.

CHARLOTTE, N. C.

[*H*=808. *T*=56. *h*=47.]

6.4	5.9	4.1	5.5	3,906	24	NW.†	SW.	8	19	8	1	4	29	11	8	5	7	13	11	1	14	0	16	0	0	0	J.
6.8	6.2	3.7	5.6	3,830	24	SW.†	SW.	8	16	14	3	7	24	6	4	4	6	13	10	0	10	0	7	0	0	0	F.
4.8	6.1	3.7	4.9	4,753	30	NW.	SW.†	7	14	9	3	16	18	3	18	5	11	12	8	0	11	0	8	0	2	0	M.
4.0	4.1	2.6	3.6	4,080	30	NE.†	SW.	8	15	8	10	13	20	5	6	5	13	13	4	0	7	0	0	1	4	0	A.
7.6	7.4	5.9	7.0	4,173	25	SW.	SW.	7	13	7	9	14	24	6	7	6	2	15	14	0	19	0	0	3	7	0	M.
4.9	6.8	4.9	5.5	3,181	30	SE.†	SW.	8	14	10	3	16	18	16	3	2	2	22	6	0	10	0	0	12	5	0	J.
5.8	.....	6.1	6.0	3,208	27	NW.	NE.	8	11	5	9	6	8	9	2	4	4	14	13	0	11	0	0	16	7	0	J.
5.1	.....	5.8	5.4	2,947	30	SW.	S.	5	5	8	7	12	10	7	2	6	11	8	12	0	13	0	0	16	11	0	A.
6.3	.....	6.1	6.2	3,909	27	NW.	N.	12	11	3	1	8	6	2	7	10	8	4	18	0	16	0	0	0	1	0	S.
3.3	.....	2.5	2.9	3,171	26	N.	SW.	8	8	0	1	5	11	4	6	19	17	4	10	1	11	0	0	0	0	0	O.
4.9	.....	3.4	4.2	3,747	23	NW.†	N.	12	10	1	3	5	2	5	4	18	17	4	9	0	10	0	2	0	0	0	N.
3.6	.....	3.3	3.4	2,171	23	NW.†	NW.	4	4	0	5	1	3	4	10	31	18	5	8	0	9	0	14	0	0	0	D.
5.3	.....	4.3	5.0	43,076	.....	....	SW.	95	140	73	55	107	173	78	77	115	116	127	123	2	141	0	47	48	37	0	Y.

CHATTANOOGA, TENN.

[*H*=783. *T*=71. *h*=60.]

7.2	6.6	6.0	6.6	4,745	26	NW.	S.	7	18	5	5	19	17	5	16	1	6	11	14	0	16	0	13	0	0	0	J.
7.6	7.0	5.4	6.6	4,354	31	NW.	NE.	4	15	13	8	11	14	8	14	0	5	10	14	0	12	0	3	0	1	0	F.
5.9	5.3	4.0	5.1	6,012	42	W.	S.	9	14	4	14	20	8	5	19	0	9	11	11	0	12	0	10	0	2	0	M.
3.0	3.5	2.2	2.9	5,096	26	SW.	S.	16	17	3	2	23	12	12	4	1	18	8	4	0	7	0	0	0	7	0	A.
6.4	6.6	4.2	5.7	4,119	23	E.	NW.†	3	18	11	5	17	14	7	18	0	6	17	8	0	16	0	0	0	10	0	M.
4.9	5.9	3.3	4.7	3,179	32	SW.	W.	8	5	5	5	7	15	22	17	6	9	18	3	0	13	0	0	6	7	0	J.
3.9	.....	5.4	4.6	3,241	25	W.	NW.	6	7	3	4	8	6	12	15	1	4	17	10	0	6	0	0	14	8	0	J.
4.8	.....	5.5	5.2	3,284	36	SW.	N.	13	9	6	4	8	4	11	4	3	7	11	13	0	15	0	0	13	9	0	A.
4.6	.....	4.2	4.4	2,926	24	E.	NE.	8	14	3	1	2	6	12	11	3	12	8	10	0	12	0	0	0	2	0	S.
4.4	.....	3.6	4.0	3,887	23	SW.	NW.†	8	8	5	6	6	7	10	10	2	13	9	9	0	13	0	0	0	2	0	O.
5.7	.....	4.5	5.1	4,137	28	S.	NE.	10	12	6	7	6	3	6	10	0	9	9	12	0	9	0	3	0	1	0	N.
4.5	.....	3.9	4.2	4,350	28	S.	NW.	8	8	3	3	9	4	10	16	1	14	6	11	0	9	0	14	0	0	0	D.
5.2	.....	4.4	4.9	49,330	.....	....	NW.	100	145	67	64	136	110	120	154	18	112	135	119	0	140	0	43	33	49	0	Y.

Monthly and yearly meteorological summaries—Continued.

CHEYENNE, WYO.

[Latitude, 41° 8′; longitude, 104° 48′.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7. a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
	In.	*In.*	*In.*	°	°	°	°	°	°	°	°	°	°	°	°					*In.*	*In.*
J......	23.912	24.28	23.45	19.7	31.2	21.1	24.0	64	-27	36.1	9.0	1	4	2	2	53	44	55	51	0.29	.14
F......	23.914	24.27	23.64	26.6	40.4	31.7	32.9	56	8	44.2	22.5	15	15	15	15	65	46	57	56	0.72	.22
M ...	23.891	24.27	23.52	21.7	37.7	28.5	29.3	64	-5	41.5	15.7	9	5	13	9	64	42	63	57	2.04	.63
A ...	24.045	24.36	23.61	37.3	58.4	47.8	47.8	76	25	61.2	34.4	19	5	19	14	52	20	39	37	0.94	.65
M ...	23.944	24.23	23.69	40.0	55.0	47.7	47.6	78	27	60.4	36.6	33	27	33	31	77	42	60	60	3.74	1.10
J......	23.949	24.19	23.66	52.5	73.8	63.6	63.3	93	37	77.0	47.6	36	25	35	32	56	20	39	38	0.56	.26
J......	24.150	24.30	23.95	61.4	....	75.0	68.2	97	45	83.6	54.9	45	......	42	44	59	......	38	48	2.31	1.02
A......	24.154	24.36	23.97	53.2	....	69.4	61.3	86	40	77.0	49.4	44	......	40	42	73	......	38	56	1.15	.60
S	24.168	24.36	23.98	45.1	....	65.5	55.3	88	30	74.7	42.4	31	......	30	31	60	......	30	46	1.66	1.15
O......	24.018	24.22	23.63	37.8	....	48.7	43.2	72	16	59.0	32.6	22	......	22	22	57	......	38	47	0.30	.18
N	24.024	24.28	23.78	25.8	....	33.9	29.8	62	7	43.7	22.5	16	......	17	17	71	......	55	63	0.59	.45
D	24.010	24.36	23.62	28.7	....	33.0	30.8	61	2	44.8	23.2	9	......	11	10	48	......	44	46	0.21	.17
Y	24.015	24.36	23.45	37.5	....	47.2	44.5	97	-27	58.6	32.6	23	.....	23	22	61	.....	46	50	14.51	.....

CHICAGO, ILL.

[Latitude, 41° 52′; longitude, 87° 38′.]

J	29.436	30.09	28.79	11.7	18.0	15.6	15.1	44	-17	23.7	6.0	5	10	10	8	74	72	79	75	1.56	.51
F ...	29.272	30.01	28.52	19.7	25.6	23.8	23.0	47	-18	30.9	14.2	14	18	17	16	80	72	76	76	1.51	.76
M ...	29.330	29.75	28.68	27.7	33.5	30.4	30.5	64	-1	37.1	22.7	20	24	22	22	75	70	71	72	2.99	1.01
A....	29.372	29.75	28.81	40.9	50.1	45.1	45.4	83	30	55.7	37.1	30	33	33	32	66	56	66	63	2.13	.90
M ...	29.160	29.53	28.81	49.6	55.5	52.7	52.6	81	32	61.3	44.9	41	42	45	43	72	62	77	70	6.22	2.43
J	29.174	29.49	28.95	63.6	71.5	67.1	67.4	90	43	75.8	58.6	54	55	56	55	71	58	69	66	1.66	.97
J	29.277	29.45	29.07	70.6	....	73.4	72.0	94	56	80.7	64.6	60	.....	61	60	69	.....	67	68	3.93	1.29
A....	29.282	29.53	29.00	66.7	....	71.6	69.2	91	51	76.7	62.0	56	.....	57	56	69	.....	62	66	2.10	1.00
S	29.308	29.60	28.91	56.4	....	62.9	59.6	88	36	66.8	52.9	46	.....	48	47	69	.....	62	66	.98	.45
O....	29.209	29.58	28.74	45.5	....	51.2	48.4	76	32	55.9	42.3	36	.....	40	38	71	....	67	69	2.95	1.31
N....	29.364	29.83	28.86	38.8	....	43.0	40.9	75	20	47.1	36.2	32	.....	36	34	79	.....	76	78	2.89	1.10
D. ..	29.299	29.66	28.75	29.7	....	32.9	31.3	53	15	37.9	26.6	25	.....	27	26	84	.....	79	82	1.94	.98
Y.....	29.290	30.09	28.52	43.4	....	47.5	46.3	94	-18	54.1	39.0	35	.....	38	36	73	.....	71	71	30.90	....

CINCINNATI, OHIO.

[Latitude, 39° 6′ N.; longitude, 84° 30′ W.]

J.....	29.554	30.16	28.99	26.9	31.5	29.5	29.3	64	6	37.1	21.2	21	22	23	22	77	68	76	74	2.78	0.72
F....	29.413	30.07	28.76	30.2	38.5	36.0	34.9	61	6	43.0	27.0	23	27	27	26	74	66	71	71	1.37	0.50
M ...	29.437	29.79	28.89	33.7	43.5	39.8	39.0	71	12	46.7	30.7	25	30	30	28	73	63	70	69	3.94	1.27
A....	29.473	29.82	28.91	46.3	61.7	56.2	54.7	84	33	65.5	44.1	34	34	39	36	63	39	53	52	1.14	0.88
M ...	29.277	29.59	28.99	56.3	69.2	63.1	62.9	88	39	72.8	53.5	48	47	49	48	73	48	63	61	2.70	1.06
J	29.295	29.53	29.04	67.3	80.3	75.1	74.2	96	48	83.1	64.4	58	56	59	58	73	45	59	59	1.75	0.57
J	29.370	29.51	29.15	71.7	....	80.7	76.2	95	58	87.4	66.8	62	.....	62	62	71	.....	54	62	2.46	0.97
A....	29.365	29.63	28.88	69.4	....	77.0	73.2	97	52	83.7	64.7	61	.....	62	62	76	.....	62	69	7.80	2.46
S	29.399	29.65	29.08	58.4	....	68.3	63.4	83	35	74.0	55.6	51	.....	52	52	77	.....	58	68	1.79	1.01
O. ...	29.342	29.66	28.90	47.1	....	53.9	50.5	79	34	60.3	43.6	40	.....	44	42	78	.....	70	74	3.05	0.63
N....	29.468	29.81	28.99	42.5	....	48.5	45.5	76	27	53.7	39.0	36	.....	39	38	77	.....	71	74	4.78	1.35
D....	29.462	29.83	28.95	33.8	....	38.9	36.4	62	16	43.2	30.9	25	.....	29	27	71	.....	70	70	1.32	0.45
Y....	29.405	30.16	28.76	48.6	....	55.6	53.4	97	6	62.5	45.1	40	.....	43	42	74	.....	65	67	34.90	....

CLEVELAND, OHIO.

[Latitude, 41° 30′ N.; longitude, 81° 42′ W.]

J ...	29.443	30.09	28.72	20.5	24.6	21.8	22.3	55	-2	29.4	14.4	16	17	16	17	83	76	80	79	3.15	0.98
F ...	29.310	30.06	28.59	24.4	31.1	28.0	27.8	53	-3	35.6	20.0	21	22	21	21	85	71	75	77	1.55	0.65
M ...	29.358	29.74	28.66	26.1	34.6	31.0	30.6	68	8	39.4	22.9	20	25	24	23	78	70	76	75	3.23	0.96
A ...	29.406	29.82	28.79	39.4	49.0	45.2	44.5	79	26	54.0	36.2	31	34	33	33	73	58	65	66	2.18	0.84
M ...	29.228	29.66	28.88	52.5	59.5	56.5	56.2	80	34	65.3	48.5	44	46	46	45	74	64	69	69	2.84	1.24
J ...	29.234	29.51	28.93	63.8	72.6	67.6	68.0	91	43	77.0	58.8	56	58	58	57	76	62	71	70	4.13	1.03
J ...	29.320	29.46	29.07	68.7	....	73.3	71.0	89	51	79.3	61.9	58	.....	59	59	70	.....	63	66	2.45	1.38
A ...	29.306	29.57	29.01	67.5	....	72.1	69.8	94	48	79.0	62.1	58	.....	59	58	72	.....	64	68	2.38	0.90
S ...	29.344	29.64	28.91	57.0	....	62.3	59.6	82	38	69.0	52.3	49	.....	51	50	76	.....	67	71	2.65	0.67
O ...	29.243	29.62	28.76	46.0	....	49.6	47.8	75	31	54.4	41.6	37	.....	38	38	73	.....	65	69	2.90	0.81
N ...	29.392	29.82	28.94	41.4	....	43.7	42.6	74	24	49.3	37.6	33	.....	34	34	73	.....	71	72	3.59	0.85
D ...	29.336	29.77	28.86	31.8	....	34.6	33.2	57	14	38.8	28.8	24	.....	25	24	73	.....	70	72	1.52	0.46
Y ...	29.327	30.09	28.59	44.9	....	48.8	47.8	94	-3	55.9	40.4	37	.....	39	38	76	.....	70	71	32.60	....

Monthly and yearly meteorological summaries—**Continued.**

CHEYENNE, WYO.

[*H*=6,105. *T*=58. *h*=50.]

Cloudiness (in tenths).				Wind.													Number of days—										
8 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
2.5	4.9	2.3	3.2	9,758	52	NW.	NW.	4	4	4	4	15	3	22	34	3	16	14	1	0	4	13	27	0	0	0	J.
2.8	4.9	3.4	3.7	8,971	48	NW.	NW.	15	7	2	2	6	7	12	35	1	15	10	4	0	9	1	27	0	0	0	F.
3.6	6.2	5.0	5.0	8,816	45	W.	NW.	13	10	1	4	11	9	18	26	1	9	16	6	0	12	10	29	0	0	0	M.
2.8	4.4	3.9	3.7	8,627	48	W.	NW.	13	8	1	8	12	8	10	26	4	14	12	4	0	4	0	10	0	2	0	A.
5.5	7.4	6.6	6.5	7,930	39	NW.	N.	29	5	4	12	12	3	6	19	3	6	11	14	0	22	0	5	0	7	0	M.
1.9	5.2	4.3	3.8	8,677	46	W.	S.	8	9	1	4	23	3	17	19	6	12	16	2	0	8	0	0	2	5	0	J.
4.0	......	5.0	4.5	7,408	42	NW.	NW.	6	6	4	8	10	2	5	19	2	8	14	9	0	11	0	0	6	8	0	J.
2.4	.....	4.9	3.6	6,452	46	S.	N.	18	6	2	8	6	3	6	12	1	14	5	12	0	7	0	0	0	3	0	A.
0.9	......	2.8	1.8	5,829	33	S.	NW.	10	4	3	4	8	3	3	24	1	21	3	6	0	5	0	1	0	3	0	S.
4.1	.....	5.2	4.6	7,261	42	NW.†	NW.	15	2	0	1	7	8	6	23	0	4	13	14	0	5	0	10	0	0	0	O.
3.8	......	3.0	3.4	6,379	36	NW.	NW.†	11	0	2	0	7	11	13	13	3	12	7	11	0	6	6	25	0	0	0	N.
2.5	......	2.8	2.6	7,617	36	NW.†	NW.	12	0	0	0	1	6	11	29	3	13	12	6	0	5	6	26	0	0	0	D.
3.1	......	4.1	3.9	93,725	.....	....	NW.	154	61	24	55	118	66	129	279	28	144	133	89	0	98	36	160	8	28	0	Y.

CHICAGO, ILL.

[*H*=715. *T*=146. *h*=134.]

8 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.4	7.1	5.8	6.1	8,294	37	SW.	W.	2	5	5	13	1	18	27	21	1	6	15	10	0	12	23	30	0	0	0	J.
4.7	6.5	3.2	4.9	7,702	45	SW.†	W.	4	7	8	12	9	15	20	12	0	11	12	6	0	9	10	26	0	0	0	F.
7.0	7.3	5.5	6.6	8,931	37	W.	NE.	6	25	8	8	5	13	17	11	0	7	11	13	0	12	11	27	0	0	0	M.
5.0	5.2	2.8	4.1	9,112	37	SW.	NE.	11	15	10	13	3	13	14	11	0	12	13	5	0	10	0	6	0	2	0	A.
6.1	6.4	5.7	6.0	7,507	44	SW.	E.	8	13	20	13	4	16	10	8	1	7	10	14	0	16	0	0	0	9	0	M.
4.4	6.3	3.4	4.7	7,383	30	SW.	SW.†	7	18	12	11	9	18	11	4	0	8	17	5	0	8	0	0	0	5	0	J.
3.5	.....	5.7	4.6	6,450	39	NE.	NE.	7	16	10	6	6	9	6	1	1	11	8	12	0	11	0	0	3	6	0	J.
4.5	...	4.1	4.3	7,730	40	NW.	SW.	9	11	8	5	1	18	9	1	0	9	11	11	0	9	0	0	1	6	0	A.
3.4	.....	2.6	3.0	6,670	27	SW.†	SW.	2	14	3	9	2	17	5	4	4	13	9	8	0	6	0	0	0	2	0	S.
5.2	.....	3.1	4.2	8,210	34	SW.	SW.	4	12	2	6	4	16	8	8	2	9	11	11	0	11	0	1	0	1	0	O.
5.7	.....	4.2	5.0	7,404	38	SW.	SW.	2	13	2	3	5	14	9	12	0	8	6	16	0	11	1	7	0	1	0	N.
6.5	.....	4.6	5.6	8,360	41	S.	SW.	13	2	0	1	12	17	9	7	1	9	5	17	0	9	6	24	0	0	0	D.
5.1	.....	4.2	4.9	93,753	.....	....	SW.	75	151	88	100	61	184	145	100	10	110	128	128	0	124	51	121	4	32	0	Y.

CINCINNATI, OHIO.

[*H*=628. *T*=153. *h*=149.]

8 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.9	6.2	6.3	6.5	6,771	26	NW.	NW.	15	13	4	13	3	15	13	16	1	3	13	15	0	13	10	27	0	0	0	J.
6.2	6.7	5.6	6.2	5,166	33	NW.	SW.	12	14	7	11	4	17	12	8	2	7	9	13	0	13	3	17	0	2	0	F.
6.2	6.4	4.0	5.5	6,550	36	NW.	N.	21	13	6	16	0	18	5	10	4	9	11	11	0	16	5	17	0	1	0	M.
3.4	3.8	2.7	3.3	5,922	30	SW.	N.	23	8	3	18	4	13	8	5	8	16	10	4	0	5	0	0	0	1	0	A.
6.9	6.5	4.8	6.1	5,240	30	S.	SE.	6	6	14	22	7	12	9	10	7	5	15	11	0	13	0	0	0	4	0	M.
5.2	5.5	3.4	4.7	4,397	24	SW.	SW.	11	8	10	13	8	19	9	8	4	8	16	6	0	7	0	0	8	2	0	J.
2.7	.....	4.3	3.5	4,225	24	W.†	SE.†	7	11	11	11	2	8	9	2	1	12	14	5	0	7	0	0	10	4	0	J.
4.1	.....	6.2	5.2	4,161	30	SW.†	SW.†	5	15	2	14	3	15	3	4	1	10	8	13	0	13	0	0	8	4	0	A.
3.8	.....	3.2	3.5	4,577	23	NW.†	NE.	7	13	5	8	4	7	4	4	8	8	15	7	0	8	0	0	0	1	0	S.
4.8	.....	6.1	5.4	5,263	35	SW.	SE.	7	7	2	17	4	6	3	15	1	9	6	16	0	15	0	0	0	2	0	O.
6.5	.....	5.9	6.2	4,875	32	NW.	SE.	6	11	3	15	1	7	4	9	4	8	4	18	0	12	0	7	0	0	0	N.
6.1	.....	5.0	5.6	5,175	35	NW.	SE.	11	4	0	18	1	9	2	9	8	7	10	14	0	7	1	19	0	0	0	D.
5.2	.....	4.8	5.1	62,322	.....	....	SE.	131	123	67	176	41	146	81	100	49	102	131	133	0	129	19	87	26	21	0	Y.

CLEVELAND, OHIO.

[*H*=678. *T*=70. *h*=61.]

8 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
8.3	7.5	7.3	7.7	7,648	44	SE.	NW.†	6	4	4	15	11	7	22	22	2	2	9	20	0	25	19	30	0	0	0	J.
5.6	5.8	5.3	5.6	6,696	36	SW.†	W.†	5	9	7	8	19	6	19	13	1	8	10	11	0	11	7	26	0	1	0	F.
6.1	6.8	7.4	6.7	8,002	32	SW.	W.	9	12	8	6	13	9	19	17	0	3	16	12	0	17	10	21	0	1	0	M.
5.1	4.8	4.1	4.7	6,196	39	S.	NW.†	11	16	4	17	9	3	13	17	0	12	7	11	0	11	0	9	0	3	0	A.
6.0	6.0	4.5	5.5	6,262	36	SW.	S.	6	11	8	14	18	6	15	13	2	5	17	9	0	13	0	0	0	5	0	M.
4.7	5.1	3.4	4.4	5,451	30	SW.	S.†	9	11	7	7	17	17	11	10	1	10	16	4	0	13	0	0	1	6	0	J.
4.7	.....	5.7	5.2	4,510	22	W.	NE.	7	12	9	5	8	8	6	6	1	9	11	11	0	10	0	0	0	6	0	J.
5.2	.....	4.3	4.8	5,051	24	SW.†	SW.	8	3	4	7	10	19	5	5	1	12	9	10	0	6	0	0	2	4	0	A.
5.5	.....	2.7	4.1	5,276	26	SE.	SE.	5	2	7	14	6	10	5	5	6	13	10	7	0	12	0	0	0	3	0	S.
7.5	.....	5.8	6.6	7,255	28	NW.	S.†	4	2	1	13	13	10	7	12	0	6	7	18	0	12	0	1	0	1	0	O.
6.9	.....	6.2	6.6	7,290	34	W.	S.	5	3	6	10	14	10	5	7	0	8	5	17	0	17	0	8	0	0	0	N.
8.1	.....	6.5	7.2	8,403	29	SW.	SW.	1	1	0	4	14	17	12	13	0	3	7	21	0	16	6	19	0	0	0	D.
6.1	.....	5.3	5.8	78,040	.....	....	S.	76	86	65	120	152	122	139	140	14	91	124	151	0	163	42	114	3	30	0	Y.

Monthly and yearly meteorological summaries—Continued.

COLORADO SPRINGS, COLO.

[Latitude, 38° 51′ N.; Longitude, 104° 47′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Mean. Maximum.	Mean. Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max, 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ...	....	....	....	18.0	38.1	24.6	26.9	63	-23	42.7	10.6	6	14	8	9	64	46	56	55	0.10	0.05
F ...	....	....	....	23.1	45.1	35.0	36.1	64	10	48.9	23.8	19	24	21	21	71	48	59	59	0.45	0.25
M ...	....	....	....	24.4	46.4	34.9	35.2	73	1	51.3	19.4	14	18	17	16	70	38	55	54	0.28	0.11
A ...	....	....	....	40.9	61.6	52.0	51.5	80	27	65.8	36.9	24	25	28	26	57	33	45	45	1.51	1.37
M ...	....	....	....	43.9	60.1	53.2	52.4	77	31	65.4	39.9	33	36	35	35	68	43	54	55	2.42	1.20
J ...	....	....	....	54.6	78.2	68.9	67.2	95	38	82.3	49.5	37	37	40	38	55	25	37	39	0.01	0.01
J ...	....	....	....	62.7	....	78.4	70.5	96	47	86.9	56.6	48	.....	48	48	62	.....	38	50	1.91	0.72
A ...	....	....	....	57.9	....	72.0	65.0	92	45	79.2	51.9	45	.....	44	44	65	.....	40	53	1.18	0.48
S ...	....	....	....	49.4	....	68.3	58.8	87	37	76.5	44.6	37	.....	43	40	65	.....	43	54	0.13	0.08
O ...	....	....	....	39.7	....	52.9	46.3	75	22	62.0	36.0	26	.....	34	30	62	.....	51	56	0.84	0.76
N ...	....	....	....	28.2	....	38.0	33.1	68	12	49.0	23.9	20	.....	24	22	74	.....	60	67	0.22	0.11
D ...	....	....	....	25.1	....	34.1	29.6	64	7	48.6	20.7	12	.....	17	15	61	.....	58	57	0.07	0.04
Y ..	....	....	....	39.4	....	51.0	47.7	96	-23	63.2	34.5	27	.....	30	29	65	.....	40	54	9.12	....

COLUMBIA. S. C.

(Latitude, 34° 0′ N.; longitude, 81° 3′ W.)

J....	....	....	....	41.5	53.2	46.6	47.1	75	21	55.2	38.4	38	42	40	40	88	69	81	79	2.30	1.22
F....	....	....	....	44.0	57.3	50.5	50.6	70	22	58.6	42.1	40	45	44	43	86	68	79	78	4.25	1.14
M....	....	....	....	46.9	60.5	51.0	52.8	77	24	62.0	42.2	42	49	46	46	85	68	84	79	6.20	1.28
A....	....	....	....	59.2	75.7	63.3	66.1	90	41	76.6	54.5	50	54	53	53	72	49	70	64	.91	.42
M....	....	....	....	65.8	78.6	69.2	71.2	94	45	80.6	62.0	59	64	63	62	79	64	81	74	6.66	2.84
J. ...	....	....	....	73.8	87.1	76.4	79.1	96	58	88.8	68.9	66	69	69	68	76	57	78	70	2.18	.96
J....	....	....	....	76.5	....	82.5	79.5	101	63	91.0	69.8	70	.....	68	69	79	.....	64	72	4.57	1.38
A....	....	....	....	75.8	....	81.0	78.2	99	58	89.6	70.6	71	.....	72	72	86	.....	75	80	5.49	1.24
S....	....	....	....	68.0	....	72.5	70.2	88	42	78.8	64.4	64	.....	66	65	88	.....	81	84	5.71	1.35
O....	....	....	....	54.9	....	63.1	59.0	82	42	70.8	51.5	50	.....	54	52	86	....	73	79	4.29	1.75
N ...	....	....	....	49.0	....	56.9	53.0	80	31	62.6	46.7	46	.....	50	48	89	.....	78	84	2.28	.80
D....	....	....	....	38.9	....	48.5	43.7	70	24	54.8	37.0	35	.....	40	38	88	.....	73	80	3.07	1.64
Y ...	....	....	....	57.9	....	63.5	62.6	101	21	72.4	54.0	53	.....	55	54	84	.....	76	77	47.91	....

COLUMBUS. OHIO.

[Latitude, 39° 58′ N.; longitude, 83° 0′ W.]

J	29.334	29.96	28.66	24.4	28.9	26.5	26.6	59	2	34.4	19.2	18	18	13	18	76	65	72	71	3.73	1.45
F ...	29.199	29.87	28.62	27.7	36.9	33.5	32.7	55	4	41.2	24.8	21	23	23	22	75	59	67	67	1.30	0.48
M ...	29.237	29.57	28.63	29.7	40.1	36.1	35.3	70	6	45.1	27.9	23	26	26	25	76	59	68	68	3.79	0.68
A ...	29.286	29.68	28.71	43.1	58.3	51.7	51.0	84	30	62.1	40.2	32	32	36	33	65	40	57	54	1.53	0.46
M ...	29.099	29.45	28.78	54.7	66.8	59.7	60.4	82	38	69.9	51.2	46	45	47	46	72	49	65	62	3.89	1.16
J	29.118	29.35	28.90	64.3	79.3	71.2	71.6	97	45	82.3	60.9	56	56	57	56	75	46	63	62	1.62	1.15
J	29.200	29.35	28.97	69.2	....	76.5	72.8	91	53	83.1	63.2	61	.....	60	61	75	.....	60	67	5.81	2.35
A ...	29.190	29.45	28.82	66.3	....	73.5	69.9	96	47	81.0	61.7	59	.....	60	60	79	.....	65	72	4.34	1.25
S.....	29.221	29.44	28.88	55.3	....	63.6	59.4	82	32	71.0	51.6	50	.....	51	50	81	.....	64	72	0.91	0.60
O ...	29.142	29.48	28.70	44.6	....	50.1	47.4	76	31	56.3	41.1	38	.....	40	39	80	.....	71	75	3.77	1.20
N ...	29.280	29.64	28.80	40.4	....	45.1	42.8	73	24	50.8	37.4	34	.....	36	35	78	.....	73	75	3.26	1.06
D. ..	29.254	29.64	28.77	30.3	....	35.2	32.8	58	13	40.6	27.8	24	.....	26	25	78	.....	69	73	1.11	0.41
Y....	29.213	29.96	28.62	45.8	....	51.9	50.2	97	2	59.8	42.2	38	.....	40	39	76	.....	66	68	35.1	....

CONCORDIA, KANS.

[Latitude, 39° 35′ N.; longitude, 97° 41′ W.]

J	28.746	29.33	28.02	9.4	22.4	14.8	15.5	61	-25	26.2	3.8	2	10	5	5	70	60	64	65	.51	.41
F...	28.574	29.25	28.13	26.2	39.8	31.3	32.4	71	-8	44.5	22.3	18	25	20	21	72	58	65	65	.46	.25
M ...	28.579	29.08	28.00	26.3	40.7	33.4	33.5	81	1	45.9	22.5	20	26	24	23	76	60	69	68	3.37	1.32
A....	28.610	29.10	28.08	45.0	65.4	56.8	55.7	93	28	69.7	43.1	36	38	40	38	72	41	55	56	.65	.27
M ...	28.418	28.76	27.97	50.9	67.2	58.6	58.9	89	37	70.8	48.5	44	46	47	46	78	48	66	64	3.98	.94
J	28.414	28.71	28.11	64.1	81.5	72.8	72.8	96	44	84.3	61.6	57	59	60	58	78	48	65	63	4.22	1.88
J	28.541	28.77	28.35	73.3	....	84.9	79.1	103	58	92.7	68.7	66	.....	64	65	78	.....	52	65	1.85	.73
A....	28.546	28.81	28.26	66.2	....	77.5	71.8	102	53	85.3	62.9	61	.....	62	62	84	.....	61	72	4.97	2.02
S	28.618	28.92	28.41	55.3	....	70.1	62.7	94	35	79.6	52.7	50	.....	50	50	81	.....	51	66	1.00	.72
O....	28.528	28.79	28.14	42.6	....	56.3	49.4	82	22	66.5	39.9	36	.....	37	36	77	.....	52	64	1.43	.79
N ...	28.662	29.08	28.27	32.1	....	40.3	36.2	75	16	49.4	30.9	28	.....	33	31	86	.....	78	82	.58	.50
D....	28.614	29.05	28.01	28.4	....	36.9	32.6	68	12	47.0	25.4	24	.....	28	26	82	.....	72	77	.22	.18
Y....	28.571	29.33	27.97	43.3	....	52.8	50.0	103	-25	63.5	40.2	37	.....	39	38	78	.....	62	67	23.2	....

Monthly and yearly meteorological summaries—**Continued.**

COLORADO SPRINGS, COLO.

[*H*=—. *T*=16. *h*=1.]

Cloudiness (In tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
2.3	3.5	1.8	2.5	....	....	....	....	....	....	....	....	....	....	....	....	....	17	13	1	0	6	7	29	0	0	0	J.
4.3	5.5	4.2	4.6	....	....	....	....	....	....	....	....	....	....	....	....	....	11	13	5	0	8	0	27	0	0	0	F.
3.8	5.4	2.7	4.0	....	....	....	....	....	....	....	....	....	....	....	....	....	14	13	4	0	9	4	26	0	0	0	M.
3.2	5.7	4.3	4.4	....	....	....	....	....	....	....	....	....	....	....	....	....	9	16	5	0	3	0	7	0	1	0	A.
4.5	7.0	5.7	5.7	....	....	....	....	....	....	....	....	....	....	....	....	....	2	22	7	0	14	0	2	0	10	0	M.
0.8	4.5	2.6	2.6	....	....	....	....	....	....	....	....	....	....	....	....	....	16	14	0	0	1	0	0	3	5	0	J.
2.9	....	5.1	4.0	....	....	....	....	....	....	....	....	....	....	....	....	....	14	16	1	0	10	0	0	10	9	0	J.
2.9	....	5.6	4.2	....	....	....	....	....	....	....	....	....	....	....	....	....	10	16	5	0	8	0	0	1	7	0	A.
1.4	....	3.1	2.2	....	....	....	....	....	....	....	....	....	....	....	....	....	19	11	0	0	3	0	0	0	3	0	S.
3.6	....	3.5	3.6	....	....	....	....	....	....	....	....	....	....	....	....	....	12	14	5	0	2	0	7	0	1	0	O.
2.8	....	3.2	3.0	....	....	....	....	....	....	....	....	....	....	....	....	....	18	8	4	0	6	1	27	0	0	0	N.
2.2	....	1.8	2.0	....	....	....	....	....	....	....	....	....	....	....	....	....	21	8	2	0	3	1	31	0	0	0	D.
2.9	....	3.6	3.6	....	....	....	....	....	....	....	....	....	....	....	....	....	163	164	39	0	73	13	156	14	36	0	Y.

COLUMBIA, S. C.

[*H*=...... *T*=—. *h*=63.]

6.2	5.1	4.9	5.4	....	....	....	....	....	....	....	....	....	....	....	....	....	11	9	11	0	9	0	9	0	0	0	J.
5.9	6.3	4.6	5.6	....	....	....	....	....	....	....	....	....	....	....	....	....	8	11	10	0	11	0	3	0	3	0	F.
4.9	5.1	3.3	4.5	....	....	....	....	....	....	....	....	....	....	....	....	....	15	5	11	0	10	0	5	0	8	0	M.
3.7	3.4	2.3	3.1	....	....	....	....	....	....	....	....	....	....	....	....	....	19	8	3	0	6	0	0	0	3	0	A.
5.4	7.0	4.5	5.6	....	....	....	....	....	....	....	....	....	....	....	....	....	5	19	7	0	13	0	0	5	9	0	M.
4.1	6.5	4.1	4.9	....	....	....	....	....	....	....	....	....	....	....	....	....	5	20	5	0	8	0	0	14	16	0	J.
4.6	....	5.6	5.1	....	....	....	....	....	....	....	....	....	....	....	....	....	6	19	6	0	11	0	0	17	7	0	J.
3.9	....	5.0	4.4	....	....	....	....	....	....	....	....	....	....	....	....	....	9	11	11	0	15	0	0	14	5	0	A.
6.3	....	6.2	6.2	....	....	....	....	....	....	....	....	....	....	....	....	....	9	5	16	0	13	0	0	0	1	0	S.
4.4	....	3.7	4.0	....	....	....	....	....	....	....	....	....	....	....	....	....	15	8	8	0	10	0	0	0	1	0	O.
5.7	....	5.1	5.4	....	....	....	....	....	....	....	....	....	....	....	....	....	9	8	13	0	7	0	1	0	0	0	N.
4.0	....	3.6	3.8	....	....	....	....	....	....	....	....	....	....	....	....	....	18	5	8	0	8	0	12	0	0	0	D.
4.9		4.4	4.8	....	....	....	....	....	....	....	....	....	....	....	....	....	129	128	109	0	121	0	30	50	48	0	Y.

COLUMBUS, OHIO.

[H=812. *T*=81. *h*=70.]

7.4	6.6	6.4	6.8	7,021	34	SW.	W.	6	9	6	10	12	13	26	11	0	5	9	17	0	20	14	27	0	0	0	J.
5.5	5.8	4.9	5.4	5,883	36	SW.	SW.†	7	9	12	6	15	15	12	11	0	7	12	10	0	13	6	21	0	0	0	F.
6.3	6.0	5.5	5.9	7,024	37	W.	W.	16	9	4	7	15	7	23	12	0	7	10	14	0	15	8	18	0	1	0	M.
3.2	4.8	3.0	3.6	5,989	42	SW.	NW.†	11	6	10	7	12	10	16	16	2	17	8	5	0	11	0	3	0	4	0	A.
6.2	6.4	4.4	5.7	5,688	39	SW.	W.	9	9	13	7	16	11	22	5	1	7	15	9	0	12	0	0	0	5	0	M.
4.6	4.3	2.9	3.9	4,645	30	SW.	SW.	16	10	5	7	15	21	4	10	2	12	14	4	0	7	0	0	7	6	0	J.
3.4	....	4.0	3.7	3,959	36	NW.	NE.	12	17	3	5	9	9	3	4	0	15	14	2	0	11	0	0	1	7	0	J.
4.2	....	4.6	4.4	3,815	26	NW.†	SW.	5	8	5	7	8	14	5	8	2	12	10	9	0	14	0	0	3	3	0	A.
4.5	....	1.9	3.2	4,222	26	W.†	S.	9	11	5	8	13	2	4	5	3	11	17	2	0	5	0	0	0	0	0	S.
5.6	....	5.9	5.8	5,914	46	SW.	NW.	3	3	2	12	10	5	13	14	0	8	9	14	0	14	0	3	0	2	0	O.
5.9	....	5.9	5.9	5,114	30	SW.	S.	8	5	3	9	11	6	10	7	1	8	5	17	0	14	0	8	0	1	0	N.
5.8	....	5.0	5.4	5,508	40	W.	S.	5	0	0	8	19	8	6	15	1	8	11	12	0	11	4	20	0	0	0	D.
5.2	....	4.5	5.0	64,782	....	....	S.†	107	96	68	93	155	121	144	118	12	117	134	115	0	147	32	100	11	29	0	Y.

CONCORDIA, KANS.

[*H*=1,384. *T*=41. *h*=34.]

3.7	3.4	3.5	3.5	5,134	44	NW.	N.	21	2	4	11	12	5	10	19	9	15	12	4	0	4	18	29	0	0	0	J.
3.8	5.4	1.7	3.8	5,382	30	NW.	S.	14	11	6	3	23	2	3	19	6	11	14	4	1	4	4	22	0	0	0	F.
4.0	6.2	3.5	4.5	6,836	37	N.	N.	20	11	7	5	16	6	8	18	2	12	12	7	0	8	7	24	0	1	0	M.
4.9	5.2	3.9	4.7	8,237	54	S.	SE.	15	7	11	19	17	4	1	11	5	10	12	8	0	6	0	4	1	0	0	A.
6.6	5.9	3.8	5.4	6,331	46	NW	SE.	16	8	6	22	11	6	5	14	5	6	16	9	0	10	0	0	0	5	0	M.
5.9	3.9	4.2	4.7	6,821	48	SE.	SE.	8	6	14	23	18	2	4	9	6	4	25	1	0	8	0	0	7	6	0	J.
4.0	....	3.4	3.7	4,232	23	SE.	SE.†	3	11	2	15	15	3	0	2	11	14	14	3	0	7	0	0	21	4	0	J.
4.7	....	4.7	4.7	3,352	36	NW.	SE.†	9	6	7	9	6	0	0	0	25	8	19	4	0	8	0	0	6	6	0	A.
2.8	....	2.1	2.4	2,688	30	S.	S.	2	2	1	3	5	1	2	4	40	14	15	1	0	3	0	0	4	1	0	S.
3.2	....	3.2	3.2	2,895	27	S.	S.	7	1	4	6	8	2	3	6	25	19	6	6	0	4	0	2	0	2	0	O.
4.5	....	3.2	3.8	4,366	32	S.	S.	13	3	5	7	16	1	4	6	5	14	8	8	0	4	1	18	0	1	0	N.
3.6	....	2.5	3.0	6,413	44	S.	NW.	8	4	4	2	15	3	9	17	0	19	7	5	0	4	4	24	0	0	0	D.
4.3	....	3.3	3.9	62,687	...	....	S.	136	72	71	125	162	35	49	125	139	146	161	60	1	70	34	123	39	26	0	Y.

Monthly and yearly meteorological summaries—Continued.

CORPUS CHRISTI, TEX.

[Latitude, 27° 49′ N.; longitude, 97° 25′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	8 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. in 24 hours.
	In.	*In.*	*In.*	°	°	°	°	°	°	°	°	°	°	°	°					*In.*	*In.*
J.....	30.228	30.74	29.83	45.3	50.9	48.8	48.3	73	16	55.6	42.2	44	47	47	46	95	87	93	92	1.91	0.53
F ...	30.030	30.47	29.76	58.2	62.2	60.6	60.3	72	43	65.3	54.4	55	55	57	56	91	80	88	86	3.50	1.62
M ...	30.053	30.52	29.60	58.7	64.8	62.2	61.9	82	41	66.9	54.4	54	55	56	55	86	73	82	80	2.99	2.39
A ...	30.047	30.29	29.82	70.7	75.0	72.2	72.6	79	57	76.0	67.4	68	67	67	67	89	77	85	84	1.45	1.06
M ...	29.872	30.07	29.62	74.5	79.0	76.4	76.6	86	44	80.7	69.5	71	71	71	71	89	76	83	83	8.72	3.22
J.....	29.878	30.05	29.67	78.0	83.1	80.9	80.7	89	66	84.3	75.1	74	75	75	75	89	76	83	83	5.46	2.16
J.....	29.991	30.10	29.85	79.8	....	84.2	82.0	90	73	87.2	76.0	75	.....	75	75	86	.....	75	81	2.25	1.45
A ...	29.932	30.14	29.74	79.6	....	84.1	81.8	92	71	87.9	76.3	76	.....	76	76	89	.....	77	83	2.16	0.76
S.....	29.988	30.22	29.89	74.9	....	80.9	77.9	91	63	83.9	71.3	70	.....	71	70	86	.....	72	79	7.25	2.83
O ...	29.986	30.22	29.80	69.9	....	75.3	72.6	85	50	78.5	67.2	66	.....	69	68	88	.....	81	85	2.91	1.99
N ...	30.078	30.32	29.61	58.6	....	63.1	60.8	83	39	66.7	56.0	56	.....	58	56	90	.. ..	83	86	8.64	4.59
D ...	30.136	30.43	29.87	54.6	....	60.8	57.7	81	37	66.0	52.0	51	.....	55	53	88	.....	81	84	0.92	0.77
Y ...	30.018	30.74	29.60	66.9	....	70.8	69.4	92	16	74.9	63.5	63	.....	65	64	89	.....	82	84	48.7	....

CRETE, NEBR.

[Latitude, 40° 38′ N.; longitude, 96° 59′ W.]

J.....	....	....	....	3.0	16.4	9.1	9.5	55	28	19.9	-1.6	-1	9	5	4	84	73	83	80	0.35	0.31
F...	....	....	....	20.1	35.1	26.7	27.3	68	15	39.4	17.4	16	25	22	21	86	70	83	80	0.61	0.36
M....	....	....	....	22.7	35.9	29.0	29.2	80	13	41.5	18.9	19	26	24	23	86	71	83	80	4.63	2.06
A. ...	....	....	....	42.9	64.3	53.3	53.5	87	26	68.3	40.7	37	45	42	41	80	53	69	67	2.31	1.74
M ...	....	....	....	48.7	64.9	56.8	56.8	83	32	68.2	46.7	44	49	49	48	85	59	76	73	5.01	2.20
J.....	....	....	....	62.3	79.2	69.3	70.3	93	46	81.4	58.8	57	62	59	59	83	58	71	71	4.02	3.02
J.....	....	....	....	72.0	....	81.4	76.7	100	56	89.4	66.7	66	.....	71	69	84	.....	71	77	2.15	0.95
A.....	....	....	....	64.5	....	75.7	70.1	99	52	83.5	61.4	62	.....	64	63	90	.....	69	79	1.67	0.43
S	....	....	....	53.6	....	68.7	61.2	95	35	76.5	50.4	48	.....	52	50	80	.....	55	68	0.13	0.09
O.....	....	....	....	40.1	....	53.5	46.8	80	24	63.1	37.6	35	.....	39	37	83	.....	59	71	2.03	1.24
N.....	....	....	....	29.2	....	38.7	34.0	75	13	48.5	26.9	23	.....	29	26	77	.....	69	73	0.17	0.13
D.....	....	....	....	25.2	....	33.8	29.5	67	2	43.4	21.9	19	.....	24	22	76	.....	70	73	0.26	0.11
Y.....	....	....	....	40.4	....	49.7	47.1	100	28	60.4	37.2	35	.....	40	38	83	.....	71	74	23.34	....

FORT CUSTER, MONT.

[Latitude, 45° 42′ N.; longitude, 107° 34′ W.]

J.....	26.897	27.33	26.34	-1.2	8.7	5.7	4.4	54	-45	15.5	-7.5	-8	1	0	-2	79	73	78	76	.39	.18
F ...	26.814	27.22	26.38	23.4	32.3	29.1	28.3	61	-2	40.1	16.1	19	22	21	21	86	69	74	76	.57	.31
M...	26.850	27.17	26.39	15.9	29.3	23.9	23.0	67	-26	33.9	12.0	12	16	17	15	86	63	77	75	.35	.08
A ...	26.855	27.45	26.28	39.2	59.3	52.9	50.5	81	25	64.5	34.7	31	26	30	29	73	33	45	50	.63	.49
M...	26.795	27.19	26.44	43.2	59.9	53.6	52.2	80	31	63.2	40.2	38	38	40	39	85	49	64	66	2.28	.61
J....	26.691	27.00	26.36	55.3	68.8	65.0	63.0	94	37	73.1	52.0	49	49	52	50	79	53	64	65	4.91	2.36
J....	26.880	27.09	26.64	60.7	....	79.8	70.2	103	45	85.1	56.8	52	.....	50	51	73	... .	38	56	1.20	.45
A ...	26.888	27.07	26.69	56.6	....	77.4	67.0	98	45	81.3	54.3	51	.....	48	49	81	.....	38	60	1.93	.48
S.....	26.912	27.28	26.59	47.9	....	72.9	60.4	94	32	78.6	45.8	39	.....	38	39	73	.....	31	52	.50	.38
O ...	26.806	27.11	26.35	39.6	....	53.5	46.6	78	16	60.9	35.9	29	.....	29	29	68	.....	43	56	.66	.33
N ...	26.893	27.17	26.48	18.5	....	29.9	24.2	64	-12	37.9	15.1	14	.....	20	17	88	.....	72	80	.40	.28
D ...	26.852	27.32	26.42	20.9	....	31.2	26.0	54	-9	37.8	17.2	17	.....	21	19	85	.....	70	77	.16	.11
Y ...	26.844	27.45	26.28	35.0	....	47.9	43.0	103	-45	56.0	31.0	29	.....	30	30	80	.....	58	66	14.00	....

DAVENPORT, IOWA.

[Latitude, 41° 30′ N.; longitude, 90° 38′ W.]

J.....	29.565	30.21	28.92	5.3	13.0	10.7	9.7	42	24	20.0	0.6	2	8	7	6	88	80	85	84	1.54	0.67
F....	29.382	30.16	28.80	16.1	25.3	21.0	20.8	60	21	30.5	12.0	13	18	16	16	87	74	83	81	1.17	0.37
M ...	29.421	29.89	28.73	25.4	34.7	30.2	30.1	61	0	38.5	22.2	21	23	23	22	83	64	74	74	2.70	0.91
A....	29.452	29.89	28.94	41.8	57.5	49.2	49.5	81	29	60.8	39.0	34	35	35	35	76	45	60	60	1.57	0.97
M....	29.242	29.58	28.86	49.2	61.6	54.7	55.2	80	32	64.6	46.5	45	44	46	45	85	56	74	72	9.23	1.61
J.....	29.259	29.55	28.98	64.1	75.8	69.0	69.6	88	46	78.5	61.7	58	58	61	59	83	57	77	72	3.86	1.33
J.....	29.363	29.55	29.21	70.6	......	78.2	74.4	95	55	85.4	67.1	66	.....	67	66	84	.....	69	77	7.31	2.82
A....	29.367	29.67	29.08	65.3	....	73.9	69.6	95	50	80.0	62.6	61	.....	62	62	87	.....	69	78	2.79	1.10
S.....	29.410	29.77	29.06	52.9	....	63.1	58.0	85	34	70.8	50.8	49	.....	50	49	88	.....	63	76	1.38	0.74
O....	29.320	29.68	28.92	42.4	....	51.4	46.9	74	30	58.3	40.5	38	.....	38	38	85	.....	63	74	2.81	2.11
N....	29.478	29.95	28.97	35.1	....	41.1	38.1	78	19	46.8	33.4	31	.....	34	32	86	.....	76	81	3.54	1.62
D ...	29.419	29.77	28.90	28.6	....	32.5	30.6	58	12	38.2	25.9	24	.....	24	24	82	.....	74	78	2.59	1.92
Y ...	29.390	30.21	28.73	41.4	....	47.9	46.0	95	24	56.0	38.5	37	.....	39	38	84	.....	72	76	40.5	....

Monthly and yearly meteorological summaries—Continued.

CORPUS CHRISTI, TEX.

[*H*—19.67. *T*—43. *h*—35.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
8.3	8.3	7.1	7.9	7,171	36	N.	SE.†	24	4	12	24	3	0	1	22	3	1	9	21	0	14	1	6	0	0	0	J.
6.3	6.4	5.0	5.9	7,344	34	N.	N.	21	8	19	19	5	1	4	10	0	7	13	9	0	6	0	0	0	2	0	F.
7.7	7.0	5.4	7.9	9,760	54	E.	SE.	20	9	19	30	4	2	1	7	1	3	13	15	0	7	0	0	0	3	0	M.
6.7	6.5	5.1	6.1	10,898	48	E.	SE.	8	2	26	48	3	0	0	3	0	2	18	10	0	4	0	0	0	3	0	A.
6.4	4.9	3.9	5.1	10,686	80	NE.	SE.	11	6	16	55	2	2	0	1	0	8	17	6	0	10	0	0	0	6	0	M.
5.4	4.8	3.5	4.6	9,250	28	E.	SE.	1	1	16	58	7	2	2	1	2	12	11	7	0	10	0	0	0	2	0	J.
2.7	.....	3.4	3.0	7,726	27	SE.	SE.	6	1	5	33	9	1	2	4	1	19	9	3	0	4	0	0	0	2	0	J.
4.2	.....	6.3	5.2	8,258	32	SE.	SE.	4	3	4	28	10	1	5	6	1	9	16	6	0	10	0	0	7	5	0	A.
4.4	.....	5.7	5.0	6,920	37	NE.	N.	24	6	14	6	1	0	4	3	2	8	14	8	0	11	0	0	1	3	0	S.
5.2	.....	3.8	4.5	7,908	36	NE.	SE.	12	5	7	24	3	1	2	5	3	13	15	3	0	4	0	0	0	0	0	O.
6.2	.....	5.8	6.0	8,260	35	NW.	N.	22	4	4	14	2	0	3	10	1	8	7	15	0	10	0	0	0	2	0	N.
5.0	.....	3.4	4.2	7,718	36	SE.	SE.	7	4	3	22	4	2	5	15	0	13	12	6	0	8	0	0	0	1	0	D.
5.7	.....	4.9	5.4	101,899	.....	....	SE.	160	53	145	361	53	12	29	87	14	103	154	109	0	98	1	6	8	29	0	Y.

CRETE, NEBR.

[*H* ...... *T*=4. *h*=2.]

7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
4.7	4.1	3.5	4.1	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9	19	8	0	3	21	31	0	0	0	J.
5.7	5.6	3.0	4.8	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	17	5	1	5	8	26	0	0	0	F.
5.8	5.9	5.4	5.7	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	13	10	0	8	10	27	0	2	0	M.
5.4	5.1	4.0	4.8	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11	11	8	0	5	0	5	0	1	0	A.
7.2	6.5	5.7	6.4	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	17	12	0	10	0	0	0	4	0	M.
6.5	5.7	4.2	5.5	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	19	6	0	7	0	0	4	3	0	J.
4.0	.....	3.9	4.0	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15	8	8	0	9	0	0	16	9	0	J.
4.4	.....	3.9	4.2	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16	10	5	0	9	0	0	4	4	0	A.
3.4	.....	2.1	2.8	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16	10	4	0	2	0	0	2	0	0	S.
3.8	.....	2.7	3.2	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	19	6	6	0	4	0	8	0	2	0	O.
4.0	.....	3.8	3.9	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	18	3	9	0	3	2	20	0	0	0	N.
4.1	.....	2.3	3.2	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	18	6	7	0	6	7	29	0	0	0	D.
4.9	.....	3.7	4.4	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	144	139	83	1	71	48	146	26	25	0	Y.

FORT CUSTER, MONT.

[*H*—3,040 B. *T*—18. *h*—26.]

7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.7	5.6	5.1	5.5	4,758	49	N.	SE.	16	4	2	41	7	10	8	8	1	6	16	8	0	7	23	30	0	0	0	J.
5.9	6.1	5.3	5.7	4,551	30	N.	N.	27	3	4	21	6	7	11	7	1	7	12	10	0	9	5	29	0	0	0	F.
6.9	5.2	4.3	5.5	4,885	38	N.	N.	30	5	6	17	9	12	4	5	5	5	17	9	0	11	12	29	0	0	0	M.
5.4	4.4	4.6	4.8	5,745	38	NW.	N.	19	2	10	17	6	11	8	16	1	10	13	7	0	6	0	11	0	0	0	A.
6.1	6.1	6.0	6.1	5,689	36	NW.	N.	23	19	13	17	4	4	2	11	0	6	15	10	0	21	0	1	0	3	2	M.
6.1	5.7	7.2	6.3	5,583	40	NW.	N.	29	5	20	10	3	2	4	15	2	3	15	12	0	12	0	0	1	5	0	J.
4.0	.....	4.5	4.2	5,183	40	NW.	SE.	10	8	6	21	4	1	0	8	4	19	3	9	0	5	0	0	7	6	0	J.
3.5	.....	4.1	3.8	4,966	52	NW.	SE.	10	10	6	19	6	3	1	7	0	16	8	7	0	8	0	0	6	4	0	A.
3.0	.....	2.9	3.0	4,460	42	N.	SE.	10	4	4	21	4	7	0	4	6	24	2	4	0	3	0	0	2	1	0	S.
5.4	.. ..	6.1	5.8	5,268	51	NW.	SE.	7	4	5	15	3	10	1	11	6	9	8	14	0	4	0	9	0	1	0	O.
3.6	.....	4.6	4.1	2,938	35	N.	SE.	3	2	0	26	5	11	4	3	6	13	6	11	0	3	10	27	0	0	0	N.
4.9	.....	5.9	5.4	4,240	24	NW.†	SE.	5	0	3	32	6	11	1	4	0	10	6	15	0	5	9	30	0	0	0	D.
5.0	.....	5.0	5.0	58,216	.....	....	SE.	189	66	79	257	63	89	44	94	32	128	121	116	0	94	59	166	16	20	2	Y.

DAVENPORT, IOWA.

[*H*=615. *T*=72. *h*=64.]

7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
4.1	5.0	4.4	4.5	5,469	39	SW.	NW.	4	10	8	9	4	7	20	24	7	10	14	7	0	8	23	31	0	0	0	J.
5.9	4.9	3.8	4.9	5,367	36	SW.†	NW.	5	5	13	10	4	9	16	19	6	10	11	8	0	8	10	27	0	0	0	F.
6.3	4.5	4.2	5.0	7,537	48	NW.†	NW.	3	12	17	7	8	2	9	26	9	9	12	10	0	11	10	26	0	0	0	M.
4.7	4.1	1.9	3.6	6,867	48	SW.	NW.	7	5	17	16	8	6	4	23	4	12	15	3	0	6	0	5	0	0	0	A.
4.8	6.2	4.8	5.3	6,634	60	SE.	E.	7	6	22	14	6	10	10	18	0	8	14	9	0	20	0	0	0	5	0	M.
4.1	4.5	3.2	3.9	5,586	50	S.	S.	5	6	7	9	25	20	3	14	1	13	13	4	0	14	0	0	0	6	0	J.
3.6	.....	4.3	4.0	5,074	42	S.	SW.	1	7	12	11	4	13	7	6	1	6	16	9	0	9	0	0	7	6	0	J.
4.0	.....	2.6	3.3	4,736	36	NW.	SW.	8	10	4	3	4	18	4	7	4	14	10	7	0	9	0	0	1	4	0	A.
3.0	.....	1.7	2.4	4,533	34	W.	NW.	2	14	4	1	1	7	9	16	6	15	11	4	0	8	0	0	0	3	0	S.
3.9	.....	2.6	3.2	5,915	32	SW.	W.	7	8	3	3	8	8	12	10	3	13	11	7	0	10	0	3	0	1	0	O.
4.4	.....	4.6	4.5	5,012	39	S.	NW.	6	12	6	0	5	5	5	17	4	12	8	10	0	7	1	15	0	2	0	N.
5.2	.....	4.7	5.0	6,688	32	S.	NW.	7	7	0	2	10	14	6	16	0	13	3	15	0	6	10	23	0	0	0	D.
4.5	.....	3.6	4.1	69,418	.....	....	NW.	62	102	113	85	87	119	105	196	45	135	138	93	0	116	54	130	8	27	0	Y.

Monthly and yearly meteorological summaries—Continued.

FORT DAVIS, TEX.

[Latitude, 30° 38′ N.; longitude, 103° 56′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Maximum in 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°						
J....	25.234	25.65	25.01	36.8	53.8	44.5	45.0	72	0	56.6	33.5	21	24	29	24	52	34	54	47	1.91	1.28
F ...	25.140	25.48	24.89	41.2	55.1	48.2	48.2	69	28	57.8	38.4	21	22	28	24	44	28	47	40	.89	.44
M...	25.136	25.53	24.81	41.1	58.8	50.4	50.1	78	26	62.3	38.4	24	24	26	25	52	29	42	41	.40	.20
A....	25.208	25.50	24.95	52.3	70.0	62.2	61.5	84	36	74.1	50.0	38	34	37	37	65	35	49	50	1.21	.32
M...	25.112	25.28	24.96	57.0	75.0	68.4	66.8	87	45	78.2	54.8	37	30	34	33	52	22	33	36	1.11	.44
J....	25.127	25.30	25.00	67.1	85.1	76.1	76.1	96	56	87.7	63.9	47	41	46	45	53	24	40	39	1.59	.32
J....	25.262	25.42	25.13	68.2	....	78.8	73.5	91	60	85.1	64.8	56	.....	52	54	65	.....	41	53	2.43	1.02
A....	25.244	25.44	25.09	66.5	....	78.4	72.4	97	55	83.8	63.5	53	.....	50	51	64	.....	42	53	3.24	1.68
S....	25.276	25.41	25.16	58.3	....	70.1	64.2	85	46	76.7	56.5	50	.....	50	50	76	.....	52	64	1.68	.54
O ...	25.201	25.41	25.02	51.9	....	64.8	58.4	85	36	73.2	49.7	42	.....	41	42	73	.....	48	60	1.93	1.20
N....	25.209	25.42	24.92	42.6	....	51.4	47.0	80	24	59.1	39.8	34	.....	35	34	74	.....	60	67	1.46	.48
D...	25.232	25.51	24.99	38.2	....	48.7	43.4	68	26	57.2	36.0	28	.....	28	28	69	.....	48	59	.26	.10
Y....	25.198	25.65	24.81	51.8	....	61.8	58.9	97	0	71.0	49.1	38	.....	38	37	62	.....	46	51	18.1	....

DENVER, COLO.

[Latitude, 39° 45′ N.; longitude, 105° W.]

J.....	24.704	25.10	24.20	18.8	37.8	25.4	27.3	76	-20	43.4	12.9	7	17	11	11	60	47	56	54	0.11	0.06
F....	24.683	25.05	24.38	30.3	47.2	38.3	38.6	70	16	51.5	26.6	19	22	21	21	64	42	53	53	0.37	0.26
M...	24.664	25.04	24.23	22.5	42.6	35.2	33.4	70	- 2	47.4	20.2	12	14	19	15	67	41	57	55	1.15	0.52
A....	24.789	25.13	24.34	41.7	63.8	54.2	53.2	81	30	67.0	39.5	26	17	30	24	55	24	46	41	1.71	1.07
M...	24.681	25.01	24.35	44.7	61.6	53.3	53.2	85	32	66.1	41.5	31	33	40	35	62	40	65	56	2.66	0.82
J.....	24.667	24.92	24.38	56.3	78.7	70.3	68.4	98	41	82.8	52.9	40	30	40	37	56	20	37	38	0.29	0.10
J.....	24.862	25.04	24.65	62.4	....	80.5	71.4	100	51	89.3	59.2	47	.....	43	45	59	.....	31	45	0.41	0.14
A....	24.881	25.10	24.69	56.0	....	74.9	65.4	92	49	82.2	53.7	46	.....	41	43	70	.....	32	51	1.51	0.79
S.....	24.894	25.10	24.72	49.3	....	72.6	61.0	90	38	78.7	46.9	38	.....	34	36	66	.....	27	46	0.11	0.08
O. ..	24.766	25.00	24.46	40.1	....	56.8	48.4	80	26	64.5	37.4	26	.....	32	29	60	.....	42	51	0.77	0.59
N....	24.784	25.05	24.49	26.9	....	41.8	34.4	70	12	49.1	25.0	20	.....	21	20	76	.....	48	62	0.33	0.24
D....	24.770	25.17	24.34	27.2	....	40.2	33.7	68	7	50.5	24.0	12	.....	14	13	59	.....	41	50	0.03	0.04
Y....	24.762	25.17	24.20	39.7	....	53.6	49.0	100	-20	64.4	36.6	27	.....	29	28	63	.....	44	50	9.51	....

DES MOINES, IOWA.

[Latitude, 41° 35′; longitude, 93° 37′.]

J	29.315	29.91	28.64	2.1	11.7	7.0	6.9	44	-27	16.0	-1.7	0	4	3	2	89	71	85	82	1.15	.54
F.....	29.135	29.90	28.63	16.9	28.5	22.5	22.6	57	-21	32.7	13.5	14	19	18	17	87	69	84	80	1.51	1.14
M....	29.159	29.67	28.55	23.3	34.6	29.2	29.0	73	-5	39.6	20.7	20	24	23	22	86	66	80	77	3.09	1.00
A....	29.183	29.66	28.68	43.1	59.3	50.5	51.0	80	21	62.4	40.0	36	36	39	37	78	46	67	64	1.15	.45
M....	28.976	29.26	28.62	48.4	60.6	54.5	54.5	81	34	64.6	46.0	44	46	47	46	84	63	76	74	7.84	1.70
J	28.980	29.30	28.68	61.5	76.2	68.0	68.6	88	43	78.5	59.0	57	59	60	59	86	56	77	73	2.32	.89
J.....	29.092	29.31	28.90	70.8	....	80.4	75.6	99	57	87.5	66.7	65	.....	67	66	83	....	66	74	3.42	1.69
A....	29.110	29.38	28.87	64.0	....	74.5	69.2	97	46	81.4	61.2	60	.....	62	61	86	.....	66	76	4.52	2.36
S	29.164	29.52	28.84	52.6	....	61.0	58.3	90	32	72.6	50.0	46	.....	51	49	80	.....	63	72	.48	.35
O.....	29.072	29.34	28.72	41.5	....	52.0	46.8	79	28	59.8	39.9	35	.....	37	36	80	.....	59	70	.84	.42
N....	29.222	29.68	28.75	31.6	....	40.0	35.8	75	15	47.9	29.8	25	.....	31	28	78	.....	71	75	2.09	1.09
D....	29.163	29.52	28.64	26.5	....	31.8	29.2	60	11	38.3	22.6	20	.....	24	22	77	.....	73	75	2.44	1.39
Y....	29.131	29.91	28.71	40.2	....	47.9	45.6	99	-27	56.8	37.3	35	.....	39	37	83	.....	72	74	31.2	....

DETROIT, MICH.

[Latitude, 42° 20′ N.; longitude, 83° 03′ W.]

J....	29.473	30.12	28.74	15.5	20.5	18.1	18.0	42	-3	24.6	11.3	12	13	14	13	86	74	82	81	1.58	0.50
F ...	29.327	30.10	28.49	20.6	27.7	24.1	24.1	46	-7	31.7	16.7	16	19	18	18	83	71	78	77	1.58	0.70
M...	29.383	29.74	28.74	23.3	34.3	28.1	28.6	65	2	36.7	20.5	19	22	21	20	83	62	76	74	2.76	0.77
A....	29.426	29.83	28.86	38.0	49.2	41.5	42.9	82	23	51.8	34.7	29	30	30	39	72	52	66	63	1.44	0.71
M...	29.244	29.65	28.84	49.4	60.7	52.6	54.2	79	30	62.7	46.0	41	41	40	41	74	52	65	64	1.94	0.60
J....	29.251	29.54	28.94	62.5	74.8	65.3	67.5	94	45	77.2	58.2	59	54	56	55	78	52	73	68	3.41	0.70
J....	29.346	29.49	29.06	67.6	....	71.4	69.5	91	50	80.9	61.0	57	.....	59	58	71	.....	66	69	3.48	1.27
A....	29.322	29.59	29.08	64.8	....	69.9	67.4	91	46	78.6	59.3	56	.....	58	57	74	.....	67	71	5.27	4.42
S. .	29.364	29.70	28.91	55.3	....	60.0	67.6	84	35	69.4	50.4	49	.....	53	51	81	.....	79	80	1.26	0.68
O ...	29.266	29.66	28.71	43.4	....	46.9	45.2	72	30	53.6	40.1	39	.....	38	39	86	.....	73	79	2.09	0.67
N....	29.420	29.88	28.91	37.7	....	41.6	39.6	70	22	47.4	35.4	32	.....	34	33	81	.....	75	78	3.05	1.46
D....	29.351	29.77	28.81	29.5	....	32.1	30.8	55	13	36.2	26.6	24	.....	25	24	81	.....	76	78	1.16	0.53
Y....	29.348	30.12	28.41	42.8	....	46.0	45.4	94	-7	54.2	38.4	36	.....	37	37	79	.....	73	73	29.0	....

Monthly and yearly meteorological summaries—Continued.

FORT DAVIS, TEX.

[*H*=4,928*B*. *T*=16. *h*=2.]

Cloudiness. (In tenths.)				Wind.													Number of days—										
7 a. m.	2 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
3.2	4.7	3.1	3.6	5,230	36	SW.	SW.	1	17	1	4	0	46	2	1	21	15	11	5	0	4	1	8	0	0	0	J.
2.5	4.0	2.3	2.9	6,138	38	SW.	SW.	1	17	3	5	2	42	2	1	14	14	14	1	0	7	0	5	0	0	0	F.
3.1	3.8	2.3	3.0	5,962	50	SW.	SW.	2	23	6	2	4	43	0	4	9	17	13	1	0	3	0	7	0	1	0	M.
3.7	5.0	2.1	3.6	5,091	36	SW.	SW.	2	32	3	4	3	35	4	4	3	15	11	4	0	11	0	0	0	5	0	A.
3.0	3.9	1.7	2.8	5,583	34	N.	SW.	4	18	6	7	4	43	6	2	3	14	17	0	0	7	0	0	0	4	0	M.
2.9	4.8	4.0	3.6	4,943	30	SW.	SW.	2	20	10	11	1	39	3	2	2	11	18	1	0	11	0	0	9	7	0	J.
3.0	.....	5.2	4.1	3,726	30	SW.	SW.†	2	5	9	14	1	14	7	5	5	10	7	14	0	17	0	0	1	5	0	J.
2.3	.....	4.5	3.4	3,821	33	NE.	NE.	4	24	4	3	1	16	4	5	1	15	9	7	0	11	0	0	5	2	0	A.
3.2	.....	3.8	3.5	3,507	23	NE.†	NE.	4	22	6	4	0	10	2	2	10	13	5	12	0	10	0	0	0	0	0	S.
2.2	.....	2.8	2.5	4,259	24	SW.†	SW.	2	21	0	1	1	26	3	1	7	16	8	7	0	9	0	0	0	1	0	O.
4.7	.....	4.3	4.5	3,867	33	NE.	SW.	2	18	5	2	2	21	3	0	7	9	8	13	0	11	0	4	0	0	0	N.
2.8	....	3.4	3.1	5,145	38	SW.	SW.	6	11	0	3	0	31	1	1	9	17	8	6	0	5	0	7	0	0	0	D.
3.0	.....	3.3	3.4	57,272	....	....	SW.	32	228	53	60	19	366	37	28	91	166	129	71	0	106	1	31	15	25	0	Y.

DENVER, COLO.

[*H*—5,281. *T*—86. *h*—79.]

Cloudiness. (In tenths.)				Wind.													Number of days—										
7 a. m.	2 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
1.3	4.1	2.3	2.6	5,903	60	NW.	S.	18	19	8	4	21	6	8	9	0	21	7	3	0	4	10	27	0	0	0	J
3.1	5.1	3.7	4.0	4,473	35	N.	S.	19	6	10	4	28	6	7	5	2	13	9	7	0	5	0	22	0	0	0	F
4.5	5.5	3.0	4.4	4,225	36	NE.	S.	12	13	11	7	27	5	6	5	7	13	10	8	0	11	8	24	0	0	0	M.
2.9	5.3	3.9	4.0	5,714	40	SW.	S.	21	5	6	6	30	5	7	10	0	14	12	4	0	5	0	2	0	0	0	A.
4.9	6.7	5.1	5.6	5,163	36	N.	N.	24	12	8	11	20	5	0	10	3	7	15	9	0	16	0	1	0	6	0	M.
2.2	4.1	3.7	3.3	5,765	44	NW.	S.	11	13	6	7	26	10	9	7	1	15	15	0	0	5	0	0	7	6	0	J.
2.5	.....	5.7	4.1	5,002	36	SW.†	S.	9	6	5	6	22	5	4	5	0	7	22	2	0	11	0	0	13	7	0	J.
3.6	.....	5.5	4.6	4,628	36	S.†	S.	12	7	1	5	21	2	6	7	1	7	19	5	0	8	0	0	2	10	0	A.
1.1	.....	3.3	2.2	4,193	30	N.†	S.	10	6	6	1	24	5	4	4	0	23	6	1	0	3	0	0	0	1	0	S.
4.1	.....	5.0	4.6	4,678	36	NW.	S.	14	4	3	6	21	5	1	8	0	7	20	4	0	4	0	7	0	0	0	O.
4.3	.....	4.0	4.2	3,454	32	N.	S.	8	9	5	2	28	1	1	4	2	9	15	6	0	6	1	25	0	0	0	N.
2.9	.....	2.4	2.6	4,622	30	NW.†	S.	9	5	5	2	25	6	2	7	1	16	12	3	0	4	2	26	0	0	0	D.
3.1	.....	4.0	3.8	57,820	.....	....	S.	167	105	74	61	293	61	55	81	17	152	162	52	0	82	21	134	22	30	0	Y.

DES MOINES, IOWA.

[*H*=866. *T*=49. *h*=65.]

Cloudiness. (In tenths.)				Wind.													Number of days—										
7 a. m.	2 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
4.3	5.4	2.3	4.0	5,419	30	W., NW.	NW.	15	2	8	19	8	7	12	22	0	14	13	4	0	5	27	31	0	0	0	J.
3.7	4.6	4.0	4.1	4,816	27	N.†	NW.	15	1	7	15	15	8	2	21	3	8	19	2	0	8	12	28	0	0	0	F.
5.7	5.5	5.6	5.6	4,231	24	NW.	NW.	15	7	15	12	10	2	6	18	8	8	13	10	0	9	10	29	0	1	0	M.
5.2	4.0	3.5	4.2	5,967	30	NW.	N.	21	6	10	12	17	6	6	10	2	12	11	7	0	9	0	5	0	2	0	A.
6.8	6.3	5.2	6.1	5,423	27	SW.	NW.	9	11	13	10	11	5	8	18	8	8	11	12	0	19	0	0	0	7	0	M.
4.7	5.9	4.3	5.0	4,350	26	S.	S.	7	3	5	11	24	8	7	5	20	10	15	5	0	8	0	0	0	9	0	J.
5.7	.....	3.3	4.5	3,541	30	N.	S.	8	3	6	9	10	9	2	6	7	14	11	6	0	10	0	0	11	6	0	J.
5.4	.....	3.7	4.6	3.841	25	SW.	S.	12	2	6	9	13	6	0	5	9	13	6	12	0	9	0	0	3	5	0	A.
4.6	.....	2.7	3.6	3,721	23	N.†	E.	7	4	8	5	6	2	2	7	19	15	4	11	0	7	0	0	1	3	0	S.
5.0	.....	3.4	4.2	5,164	31	S.	N.	13	1	3	8	8	5	5	11	8	14	6	11	0	6	0	5	0	2	0	O.
4.5	.....	3.6	4.0	4,117	30	S.	N.	16	1	3	3	10	4	1	6	16	17	3	10	0	5	1	19	0	1	0	N.
5.9	.....	4.2	5.0	5,571	30	N.	N.	13	2	0	4	11	12	7	9	4	13	3	15	0	7	11	27	0	0	0	D.
5.1	.....	3.8	4.6	56,161	.....	....	N.†	151	45	84	117	143	74	58	138	104	146	115	105	...	102	61	144	15	36	...	Y.

DETROIT, MICH.

[*H*=662. *T*=81. *h*=72.]

Cloudiness. (In tenths.)				Wind.													Number of days—										
7 a. m.	2 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.8	7.7	7.1	7.2	7,428	48	SW.	W.	11	8	6	13	3	7	23	22	0	5	9	17	0	16	25	30	0	0	0	J.
6.1	7.0	4.7	5.9	7,410	36	SW.†	SW.	5	7	13	1	18	19	13	11	0	7	11	11	0	9	11	29	0	0	0	F.
6.5	7.2	5.1	6.3	8,546	32	E.	W.	11	14	9	2	9	9	20	19	0	4	14	13	0	12	11	26	0	0	0	M.
5.1	6.7	4.0	5.3	7,179	36	S.	NW.	6	14	14	5	12	7	11	20	1	10	9	11	0	9	0	12	0	5	0	A.
6.5	7.3	5.0	6.2	7,453	40	W.	W.	7	17	16	2	10	12	19	10	0	2	19	10	0	12	0	1	0	2	1	M.
6.3	5.6	4.4	5.4	6,598	45	S.	SW.†	9	12	11	1	19	19	12	7	0	6	17	7	0	13	0	0	2	7	0	J.
5.7	.....	6.8	6.2	5,757	28	W.	NE.	8	19	3	2	8	10	7	5	0	9	15	7	0	11	0	0	1	8	0	J.
4.9	.....	4.5	4.7	5,800	30	W.	SW.	7	13	3	1	5	20	6	4	3	12	7	12	0	11	0	0	3	3	0	A.
4.2	.....	2.1	3.2	5,791	26	S.†	W.	3	8	6	6	7	8	10	8	4	12	9	9	0	11	0	0	0	2	0	S.
6.8	.....	6.4	6.6	7,366	35	W.	SW.	9	1	7	1	11	15	5	12	1	9	5	17	0	14	0	2	0	2	0	O.
6.3	.....	5.4	5.8	7,349	34	E.	NW.	10	3	7	1	12	5	6	16	0	10	3	17	0	13	1	12	0	0	0	N.
7.2	.....	5.4	6.3	8,337	38	SW.	S.	3	2	0	1	17	13	10	16	0	6	4	21	0	17	10	22	0	0	0	D.
6.0	.....	5.1	5.8	85,014	.....	....	W.	89	118	95	36	131	144	142	150	9	92	122	152	0	148	58	134	6	29	1	Y.

Monthly and yearly meteorological summaries—Continued.

DODGE CITY, KANS.

[Latitude, 37° 45′ N.; longitude, 100° 00′ W.]

Month and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	8 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J	27.517	28.04	26.94	13.6	34.3	20.4	22.8	69	-18	36.9	98.0	8	17	13	13	79	56	73	70	0.23	0.11
F ...	27.385	27.97	26.93	28.5	48.4	36.2	37.7	78	4	52.7	25.9	24	28	28	27	85	54	73	70	0.73	0.39
M ...	27.385	27.91	26.83	27.0	46.6	36.0	36.5	75	- 2	51.1	23.7	22	26	25	24	82	54	67	68	0.93	0.50
A ...	27.449	27.92	27.00	46.3	67.7	56.8	56.9	90	31	71.7	43.4	41	50	44	45	84	56	67	69	4.08	1.66
M ...	27.283	27.59	26.86	51.6	70.6	59.2	60.5	84	39	74.2	48.8	47	48	50	4	86	48	72	69	2.86	1.26
J.....	27.281	27.54	26.92	64.3	84.9	74.4	74.5	96	50	85.6	60.7	58	54	57	5	80	36	56	57	5.16	3.24
J.. ..	27.432	27.66	27.20	72.6	....	85.5	79.0	102	60	92.4	67.5	63	.....	61	6	74	.....	46	60	4.07	1.50
A ...	27.429	27.69	27.15	67.2	....	79.8	73.5	104	52	86.2	62.5	61	.....	60	6	81	.....	53	67	3.00	0.84
S.....	27.488	27.72	27.25	56.2	....	72.7	64.4	94	41	82.0	53.5	50	.....	49	4	79	.....	45	62	0.78	0.70
O ...	27.394	27.71	27.03	43.1	....	58.4	50.8	85	30	69.1	41.1	34	.....	37	3	73	.....	48	61	0.81	0.78
N ...	27.488	27.84	27.13	34.7	....	41.5	38.1	84	18	50.8	31.5	27	.....	28	2	75	.....	62	68	0.06	0.04
D ...	27.456	27.92	26.95	28.7	....	39.1	33.9	70	11	50.7	26.0	24	.....	28	2	81	.....	67	74	0.23	0.12
Y ...	27.416	28.04	26.83	44.5	....	55.0	52.4	104	-18	67.0	41.2	38	.....	40	3	80	.....	61	66	22.9	....

DUBUQUE, IOWA.

[Latitude, 42° 30′ N.; longitude, 90° 44′ W.]

Month and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	8 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
J.....	29.524	30.15	28.77	1.0	12.0	8.0	7.0	37	-30	16.7	-2.5	-5	5	2	1	75	73	77	75	1.20	.57
F....	29.337	30.13	28.74	12.9	24.6	18.8	18.8	51	-23	28.2	8.8	8	17	13	12	79	73	79	77	1.31	.74
M...	29.391	29.88	28.66	22.4	31.2	26.6	26.7	58	-5	34.3	18.4	16	22	20	20	78	70	78	75	3.44	.90
A ...	29.413	29.85	28.91	40.5	56.3	46.8	47.9	82	28	58.2	37.9	33	35	38	36	75	49	74	66	2.58	1.11
M...	29.198	29.52	28.80	47.6	60.5	53.5	53.9	78	30	62.6	45.4	42	47	47	45	80	65	79	75	5.84	1.32
J	29.208	29.51	28.96	62.3	76.5	68.4	69.1	89	42	78.9	59.3	56	60	61	59	80	59	77	72	5.28	2.08
J....	29.314	29.50	29.10	70.4	....	77.8	74.1	94	54	85.4	65.5	65	.....	68	66	83	.....	72	78	3.59	1.48
A....	29.318	29.58	29.00	64.7	....	73.6	69.2	96	48	80.5	61.0	60	.....	63	61	84	.....	70	77	1.73	.68
S	29.364	29.68	28.95	52.0	....	62.3	57.2	83	31	70.5	48.8	47	.....	52	50	85	.....	70	77	2.01	1.19
O....	29.270	29.62	28.85	41.7	....	50.7	46.2	77	28	57.7	39.3	37	.....	42	39	84	.....	73	78	1.62	1.04
N ...	29.430	29.93	29.00	33.7	....	40.4	37.0	72	16	46.1	31.9	29	.....	35	32	83	.....	81	82	2.75	1.35
D....	29.352	29.72	28.82	26.3	....	31.1	28.7	58	8	36.4	23.4	21	.....	25	23	82	.....	79	80	1.96	1.20
Y....	29.343	30.15	28.66	39.6	....	46.5	44.6	96	-30	54.6	36.4	34	.....	39	37	81	.....	76	76	33.31	....

FORT DU CHESNE, UTAH.

[Latitude, 40° 35′ N.; longitude, 109° 50′ W.]

Month and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	8 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
J.....	25,101	25.72	23.98	-5.9	12.9	3.4	3.5	42	-38	19.5	-9.7	-14	6	-6	-5	68	74	67	70	0.41	0.20
F.....	25.046	25.43	24.52	12.6	31.3	21.9	21.9	49	-5	36.0	9.0	9	26	18	18	85	80	85	84	0.61	0.31
M ...	24.957	25.47	24.57	25.6	43.4	36.5	35.2	69	10	49.8	20.4	20	30	30	27	80	62	79	74	0.22	0.07
A	25.051	25.37	24.64	37.1	64.0	52.5	51.2	83	19	69.1	32.6	29	36	34	33	73	38	53	55	1.05	1.04
M....	24.940	25.25	24.65	43.7	65.8	58.7	56.1	85	23	70.8	38.1	36	34	38	36	75	35	49	53	0.69	0.38
J.....	24.929	25.12	24.69	58.2	79.0	71.6	69.6	95	32	84.8	46.5	35	41	42	40	48	29	37	38	0 00	0.00
J.....	25.088	25.30	24.92	61.7	....	84.7	73.2	102	41	91.4	54.4	40	.....	38	39	47	.....	24	35	0.69	0.32
A....	25.104	25.27	24.92	52.4	....	78.9	65.6	95	44	84.6	49.7	39	.....	38	38	61	.....	27	44	1.09	0.55
S.... ..	25.120	25.30	24.90	44.2	....	76.1	60.2	91	36	84.7	44.1	29	.....	37	33	56	.....	27	41	0.37	0.37
O. ...	25.044	25.29	24.77	32.5	....	54.5	43.5	80	17	65.7	31.9	18	.....	31	24	56	.....	42	49	0.15	0.07
N....	25.087	25.31	24.82	23.0	....	36.1	29.6	58	10	47.2	22.6	15	.....	24	20	73	.....	62	68	0.26	0.22
D....	25.152	25.55	24.74	12.4	....	23.1	17.8	47	-10	36.0	11.3	8	.....	17	13	84	.....	78	81	0.92	0.42
Y....	25.052	25.72	23.98	33.1	....	49.8	44.0	102	-38	61.6	29.2	22	.....	28	26	67	.....	.....	58	6.46	....

DULUTH, MINN.

[Latitude, 46° 48′ N.; Longitude, 92° 8′ W.]

Month and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	8 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
J.....	29.477	29.91	28.76	-2.7	6.6	2.4	2.1	37	-34	11.7	-7.1	-11	1	-3	-4	75	77	80	77	1.53	.52
F. ..	29.279	30.11	28.80	7.1	17.1	12.0	12.1	50	-32	22.4	3.0	4	12	9	8	87	82	88	86	.24	.12
M ...	29.402	29.93	28.78	9.5	20.5	16.5	15.5	45	-14	21.6	6.6	6	16	13	12	87	84	88	86	.81	.35
A ...	29.409	29.76	28.86	31.1	38.4	35.4	35.0	67	18	45.3	28.5	28	31	30	30	88	77	80	82	1.97	.88
M ...	29.201	29.69	28.79	38.0	45.7	42.8	42.2	70	25	51.8	35.2	32	34	35	34	80	70	75	75	4.12	1.22
J.....	29.150	29.53	28.82	50.2	56.6	54.5	53.8	85	38	65.5	45.7	45	47	49	47	84	73	83	80	5.54	2.02
J.....	29.272	29.51	28.92	59.7	....	66.6	63.2	89	45	75.1	54.7	52	.....	54	53	78	.....	66	72	3.86	2.43
A ...	29.253	29.61	28.97	59.6	....	66.2	62.9	95	46	73.3	54.4	53	.....	56	54	79	.....	70	74	4.17	2.82
S....	29.298	29 63	28.74	50.6	....	57.0	53.8	78	36	63.6	47.5	44	.....	49	46	79	.....	76	78	2.27	.71
O....	29.218	29.55	28.87	40.1	....	44.3	42.2	73	27	49.3	38.0	35	.....	38	36	82	.....	79	80	1.68	.99
N ...	29.386	29.91	28.96	31.7	....	35.2	33.4	58	4	39.5	29.0	27	.....	30	28	82	.....	81	82	.87	.42
D....	29.281	29.72	28.85	20.3	....	27.0	23.6	49	2	31.5	17.9	16	.....	21	18	85	.....	79	82	.25	.09
Y ...	29.302	30.11	28.74	32.9	....	38.3	36.6	95	-34	46.1	29.4	28	.....	32	30	82	.....	79	80	27.3	....

Monthly and yearly meteorological summaries—Continued.

DODGE CITY, KANS.

[*H*=2,523. *T*=44. *h*=37.]

Cloudiness (in tenths).				Wind.												Number of days—											
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder storms.	Auroras.	Months and year.
2.8	2.5	1.7	2.3	6,246	36	SW.	NE.	10	32	2	11	16	16	4	2	0	19	11	1	0	5	13	30	0	0	0	J.
2.7	4.0	2.1	2.9	6,596	36	S.†	NE.	6	37	1	7	24	12	0	0	0	15	12	2	0	6	2	22	0	0	0	F.
3.7	4.1	2.2	3.4	9,321	56	S.	S.†	21	27	4	4	27	6	1	2	1	13	15	3	0	7	5	22	0	0	0	M.
4.5	4.3	2.6	3.8	10,357	66	SE.	S.	6	26	5	13	32	7	0	1	0	15	9	6	0	10	0	1	0	5	0	A.
4.4	3.9	3.7	4.0	10,791	50	SE.	SE	8	22	3	23	18	9	3	7	0	11	16	4	0	9	0	0	0	5	0	M.
2.8	1.7	3.5	2.6	11,522	48	SE.	SE.	4	23	5	51	6	0	0	0	1	15	15	0	0	7	0	0	10	5	0	J.
2.4	.....	2.7	2.6	8,985	36	SE.	SE.	2	10	2	44	2	2	0	0	0	17	13	1	0	8	0	0	19	5	0	J.
4.9	.....	3.4	4.2	7,290	56	SE.	SE.	2	21	9	24	3	2	0	0	1	10	12	9	0	13	0	0	10	4	0	A.
1.7	.....	1.5	1.6	6,628	40	N.	S.	0	16	9	8	23	1	0	0	3	25	5	0	0	4	0	0	3	1	0	S.
3.0	.....	2.7	2.8	7,102	54	S.	S.	5	21	5	3	22	2	3	0	1	18	10	3	0	4	0	2	0	0	0	O.
6.4	.....	3.8	5.1	7,174	45	S.	S.	13	11	4	4	24	0	1	1	2	11	11	8	0	3	1	17	0	0	0	N.
3.4	.....	2.6	3.0	7,611	48	S.	S.†	15	7	9	3	15	1	8	0	4	16	9	6	0	5	1	26	0	0	0	D.
3.6	.....	2.7	3.2	99,623	.....	....	S.	92	253	58	195	212	58	20	13	13	185	138	43	0	81	22	120	42	25	0	Y.

DUBUQUE, IOWA.

[*H*=665. *T*=53. *h*=47.]

4.7	5.0	4.4	4.7	2,486	25	W.	NW.	11	7	3	10	7	3	12	18	22	12	9	10	0	6	25	30	0	0	0	J.
4.3	4.6	3.4	4.1	2,994	24	W.	NW.†	2	0	7	10	10	5	16	16	21	11	13	5	0	8	13	27	0	0	0	F.
5.9	5.8	5.2	5.6	5,124	30	NW.	NW.	8	9	14	13	5	1	13	28	2	8	13	10	0	9	13	27	0	0	0	M.
5.1	5.1	3.8	4.6	4,921	25	SW.	NW.	11	8	10	16	11	6	9	18	1	11	12	7	0	12	0	6	0	2	1	A.
5.2	7.0	6.0	6.1	4,348	25	NW.†	W.	3	9	9	18	8	4	21	19	2	6	13	12	0	15	0	1	0	2	1	M.
4.7	5.9	3.9	4.8	3,689	25	S.	S.	6	6	4	14	25	6	15	8	6	11	12	7	0	12	0	0	0	4	0	J.
4.2	.....	4.9	4.6	3,077	21	N.	NW.†	3	6	9	10	10	4	8	10	2	12	8	11	0	10	0	0	7	6	0	J.
4.4	.....	3.4	3.9	3,154	20	NW.	NW.	10	8	2	4	9	9	4	12	4	16	6	9	0	7	0	0	2	2	0	A.
3.0	.....	2.9	3.0	3,129	25	NW.	W.	3	2	3	4	8	3	15	14	8	16	6	8	0	9	0	1	0	2	0	S.
4.3	.....	4.4	4.4	3,595	25	NW.†	NW.	9	3	2	7	7	8	8	10	8	12	5	14	0	7	0	2	0	1	0	O.
5.3	.....	4.7	5.0	2,974	25	SW.	NW.	7	2	2	5	8	5	4	16	11	12	4	14	0	6	1	15	0	2	0	N.
5.4	.....	4.6	5.0	3,782	23	NW.	NW.	8	3	1	2	12	8	10	13	5	12	7	12	0	5	11	25	0	0	0	D.
4.7	.....	4.3	4.6	43,273	.....	....	NW.	81	63	66	113	120	62	135	182	92	139	108	119	0	106	63	134	9	21	2	Y.

FORT DU CHESNE, UTAH.

[*H*=4,900. *T*=12. *h*=4.]

3.9	5.6	3.5	4.4	1,453	28	W.	NW.	12	8	5	11	7	7	6	15	22	13	10	8	0	5	28	31	0	0	0	J.
4.3	4.9	2.7	4.0	1.390	20	E.(†)	N.	27	4	8	6	6	5	8	6	22	10	16	3	0	6	7	29	0	0	0	F.
3.8	5.6	3.4	4.3	2,337	39	SW	W.	12	5	12	9	4	3	15	5	28	10	15	6	0	6	1	30	0	0	0	M.
3.5	4.1	2.2	3.3	1,076	29	....	W.	9	2	6	4	10	4	16	5	34	15	14	1	0	3	0	14	0	0	0	A.
4.6	5.5	4.9	5.0	3,680	42	....	W.	14	9	5	13	9	9	15	13	6	9	16	6	0	5	0	2	0	0	0	M.
2.3	2.9	3.3	2.8	5,277	54	NW.	W.	10	8	7	13	10	8	28	5	1	17	11	2	0	0	0	0	6	0	0	J.
2.8	.....	3.8	3.0	4,272	44	S.	S.	0	9	2	2	18	10	11	7	3	16	7	8	0	4	0	0	21	3	0	J.
2.8	.....	3.4	2.8	3,599	41	NW.	S.	5	8	2	7	18	7	6	6	3	19	8	4	0	5	0	0	5	2	0	A.
0.8	.....	2.5	1.6	2,682	37	SW.	S.	3	5	7	9	19	6	4	1	6	18	11	1	0	2	0	0	2	0	0	S.
3.2	.....	3.5	3.4	3,517	38	W.	S.	4	9	3	9	16	2	7	8	4	13	13	5	0	3	0	15	0	0	0	O.
4.6	.....	4.0	4.3	2,022	27	W.	SE.	4	11	0	16	8	3	3	3	12	14	5	11	0	3	0	25	0	0	0	N.
3.4	.....	2.5	3.0	1,285	16	W.	NE.	10	12	2	4	3	0	5	4	22	16	9	6	1	4	9	31	0	0	0	D.
3.2	.....	3.3	3.5	32,590	.....	....	S.	110	90	59	103	128	64	119	78	163	170	135	61	1	46	45	177	34	5	0	Y.

DULUTH, MINN.

[*H*=670.45. *T*=70. *h*=56.]

4.6	5.1	4.5	4.7	4,763	29	W.	NW.	2	16	3	9	9	21	10	22	1	11	13	7	0	11	29	31	0	0	1	J.
6.9	5.9	5.3	6.0	4,520	40	NW.	W.	9	15	2	4	6	16	19	16	0	4	16	9	0	6	21	29	0	0	0	F.
5.5	5.4	4.5	5.1	6,457	40	NE.	NE.	2	41	1	6	0	6	12	22	3	9	12	10	0	9	22	31	0	0	0	M.
5.4	5.5	4.7	5.2	6,085	29	NE.	NE.	4	45	1	2	4	4	12	16	2	10	10	10	0	9	0	22	0	2	3	A.
5.2	6.9	6.0	6.0	5,148	26	NE.	NE.	1	45	1	0	1	6	11	19	9	6	13	12	0	13	0	8	0	0	0	M.
4.1	4.5	5.4	4.7	4,249	28	NE.	NE.	3	51	4	9	2	5	3	3	10	9	13	8	0	17	0	0	0	6	0	J.
4.2	.....	4.2	4.2	4,496	34	NE.	NE.	4	32	1	1	0	12	2	8	2	11	7	13	1	11	0	0	0	3	0	J.
3.9	.....	4.6	4.2	4,786	22	NE.	SW.	2	15	1	3	1	18	6	15	1	16	6	9	0	7	0	0	2	2	0	A.
4.8	.....	4.4	4.6	4,777	24	W.†	NW.	2	13	1	4	2	9	9	17	3	6	9	15	0	12	0	0	0	3	0	S.
6.5	.....	5.8	6.2	5,018	24	NE.†	NW.	3	14	5	5	1	10	8	14	2	5	8	18	0	7	0	3	0	0	0	O.
6.3	.....	4.4	5.4	4,605	28	NE.	NW.†	2	8	0	7	1	15	3	20	4	7	9	14	1	7	3	17	0	1	0	N.
5.9	.....	5.0	5.4	5,100	32	NW.	SW.	2	1	0	4	0	24	8	21	2	8	11	12	0	6	17	30	0	0	0	D.
5.3	.....	4.9	5.1	60,004	.....	....	NE.	36	295	20	54	27	146	103	193	39	102	127	137	2	115	92	171	2	17	4	Y.

Monthly and yearly meteorological summaries—**Continued.**

EASTPORT, ME.

[Latitude, 44° 54′ N.; longitude, 66° 59′ W.]

Month and year.	Pressure.			Temperature.								Dew point.				Relative Humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	8 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	8 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. in 24 hours.
	In.	*In.*	*In.*	°	°	°	°	°	°	°	°	°	°	°	°					*In.*	*In.*
J....	29.903	30.71	28.74	10.1	17.3	13.6	13.7	47	-12	23.0	4.5	3	8	6	6	73	69	72	72	5.08	1.34
F....	29.956	30.45	29.30	19.6	26.0	22.1	22.6	46	- 8	30.4	14.4	14	16	15	15	79	68	76	74	4.81	1.80
M...	29.859	30.58	29.35	25.8	32.5	28.7	29.0	48	4	34.5	22.8	20	23	22	22	81	71	75	76	4.26	1.07
A....	29.957	30.42	29.43	34.1	40.6	34.8	36.5	56	13	42.9	29.7	25	26	27	26	72	59	74	68	2.01	.52
M...	29.941	30.16	29.66	43.1	49.5	43.2	45.3	66	30	52.1	38.2	36	37	37	37	78	67	80	75	2.74	.74
J. ...	29.809	30.14	29.44	53.8	59.0	51.2	54.7	88	40	64.1	46.2	48	48	46	47	81	69	85	78	1.94	.68
J. ..	29.870	30.30	29.15	58.6	....	57.6	58.1	77	45	67.4	49.9	53	......	52	52	83	......	83	83	3.46	1.00
A....	29.845	30.21	29.43	58.1	....	58.0	58.0	79	47	66.9	51.6	53	......	53	53	85	......	84	84	4.50	1.29
S. ...	29.994	30.60	29.10	52.8	....	52.7	52.8	71	36	59.8	47.4	48	......	48	48	86	......	86	86	5.44	1.83
O....	29.802	30.45	29.02	43.1	....	43.6	43.4	62	31	49.0	38.4	37	......	38	37	81	......	80	80	7.95	3.04
N ...	30.039	30.75	29.36	36.6	....	37.0	36.8	64	5	43.2	31.0	30	......	31	31	78	......	80	79	6.70	2.08
D....	29.820	30.45	28.88	28.2	....	28.5	28.4	52	- 3	34.3	22.1	21	......	22	22	76	......	77	77	4.36	1.72
Y....	29.900	30.75	28.74	38.7	....	39.2	39.9	88	-12	47.3	33.0	32	......	33	33	79	......	79	78	53.3	......

FORT ELLIOTT, TEX.

[Latitude, 35° 30′ N.; longitude, 100° 21′ W.]

J....	27.364	27.89	26.88	19.5	39.5	28.0	29.0	77	-14	44.8	16.0	16	28	22	22	88	66	80	78	.32	.24
F ...	27.241	27.75	26.78	33.2	49.7	40.1	41.0	78	9	54.4	29.7	30	36	34	34	90	63	80	78	.61	.27
M ...	27.244	27.78	26.56	32.1	51.6	40.5	41.4	87	9	56.3	27.7	26	30	27	28	82	53	64	66	.40	.18
A ...	27.300	27.70	26.96	49.9	68.4	58.6	59.0	89	37	72.0	47.0	43	45	44	44	78	49	63	64	2.69	1.26
M ...	27.145	27.43	26.79	53.5	71.9	62.1	62.5	94	40	76.2	49.2	47	50	51	49	79	49	68	66	3.19	1.14
J....	27.142	27.35	26.82	64.9	85.8	76.2	75.6	100	53	88.9	63.2	55	55	54	55	70	38	50	53	1.34	1.00
J....	27.295	27.52	27.09	70.8	....	87.2	79.0	101	60	92.7	67.1	59	.....	58	58	68	.....	39	58	2.50	1.80
A ...	27.277	27.48	26.97	67.0	....	80.7	73.8	104	57	87.6	64.4	57	.. ..	59	58	73	.....	51	62	2.27	.80
S....	27.344	27.58	27.11	57.9	....	75.4	66.6	93	45	83.8	56.0	49	.....	51	50	74	....	44	59	.71	.65
O ...	27.254	27.50	26.92	47.4	....	60.6	54.0	88	34	70.8	44.8	42	. ...	42	42	80	.....	53	66	.85	.83
N ...	27.346	27.67	26.98	38.2	....	43.2	40.7	84	22	52.5	35.2	33	.....	32	32	84	.....	68	76	.79	.48
D ..	27.337	27.72	26.87	33.4	....	41.5	37.4	72	19	52.8	31.0	26	.....	25	26	74	.....	56	65	.84	.36
Y ...	27.274	27.89	26.56	47.3	....	57.8	55.0	104	-14	69.4	42.6	40	....	42	42	78	.....	60	66	16.5	....

EL PASO, TEX.

[Latitude, 31° 47′ N.; longitude, 106° 30′ W.]

J	26.294	26.74	26.01	33.6	54.0	46.8	44.8	75	13	59.4	30.7	24	32	30	29	67	45	54	55	.32	.28
F ...	26.205	26.55	25.97	39.7	58.7	51.8	50.1	74	29	62.5	37.0	32	37	39	36	75	47	64	62	1.51	1.10
M ...	26.181	26.58	25.82	43.1	63.9	56.7	54.6	84	28	68.1	39.6	31	35	34	34	66	35	44	48	.95	.62
A. ...	26.230	26.52	25.96	55.0	76.9	68.8	66.9	87	44	80.4	52.2	40	38	42	40	59	26	40	42	.74	.74
M ...	26.119	26.28	25.94	58.9	81.2	74.2	71.4	93	47	84.6	56.4	36	37	37	37	45	21	28	31	.15	.14
J	26.097	26.29	25.93	70.3	92.8	86.0	83.0	104	60	97.2	67.8	43	44	41	42	40	19	24	28	.42	.42
J	26.240	26.42	26.08	71.9	....	88.2	80.0	101	63	95.2	69.0	57	...	54	56	62	...	34	48	1.39	.54
A....	26.209	26.45	26.05	70.6	....	89.1	79.8	102	59	93.5	68.4	54	...	49	52	59	...	29	44	1.32	.94
S	26.252	26.42	26.08	61.7	....	80.0	70.8	94	51	85.4	60.7	51	...	48	50	69	...	35	52	.49	.26
O ...	26.191	26.41	26.01	53.1	....	72.4	62.8	91	38	79.2	52.2	43	...	40	42	71	...	37	54	1.13	.66
N....	26.222	26.46	26.01	44.0	....	57.9	51.0	79	25	64.1	42.0	34	...	34	34	70	...	46	58	1.32	.72
D....	26.290	26.58	26.01	36.7	....	51.5	44.1	70	29	57.7	34.8	29	...	29	29	73	...	43	58	.05	.04
Y....	26.211	26.74	25.85	53.2	....	68.6	63.3	104	13	77.0	51.0	40	.....	40	40	63	.....	40	48	9.79	......

ERIE, PA.

[Latitude, 42° 7′ N.; longitude, 80° 5′ W.]

J.....	29.392	30.03	28.73	20.1	22.7	20.2	21.0	55	- 6	31.6	13.4	16	17	16	16	85	80	84	83	2.79	.62
F.....	29.282	29.99	28.61	23.6	28.6	25.7	26.0	51	- 8	37.8	18.1	18	21	20	19	78	74	78	77	1.66	.74
M....	29.317	29.72	28.38	24.0	29.3	27.7	27.0	67	3	36.5	20.0	18	21	21	20	79	74	78	77	2.04	.37
A ...	29.365	29.79	28.76	38.2	45.1	42.1	41.8	73	22	50.4	34.7	28	32	31	30	69	63	68	67	2.70	.90
M ...	29.201	29.60	28.85	53.4	56.0	54.1	54.5	81	36	62.9	47.7	43	43	44	43	69	64	70	67	2.26	1.00
J.....	29.195	29.47	28.89	64.6	70.5	66.1	67.1	88	44	74.8	58.6	54	55	56	55	70	60	70	64	2.38	1.09
J.....	29.282	29.44	28.97	68.5	....	70.5	69.5	87	52	76.9	60.7	56	......	57	56	65	......	64	69	3.17	2.45
A ...	29.253	29.52	28.90	67.0	....	69.7	68.4	88	48	75.0	61.9	57	......	58	57	71	......	67	75	3.76	1.90
S.....	29.298	29.66	28.88	57.1	....	60.0	58.6	80	37	66.6	52.1	49	......	51	50	76	......	74	76	2.86	.94
O ...	29.193	29.58	28.67	45.5	....	47.8	46.6	72	34	54.2	40.7	38	......	39	39	7[illegible]	......	74	76	3.17	.78
N ...	29.347	29.79	28.84	41.2	....	42.7	42.0	74	20	49.9	37.2	34	......	34	34	78	......	75	76	3.38	.74
D ...	29.274	29.74	28.74	31.4	....	33.9	32.6	55	8	38.2	28.3	24	......	26	25	76	......	74	75	1.77	.59
Y ...	29.283	30.03	28.38	44.6	....	46.7	46.3	88	-8	54.6	39.4	36	.....	38	37	74	.....	73	73	31.94	....

Monthly and yearly meteorological summaries—Continued.

EASTPORT, ME.

[*H*=53. *T*=52. *h*=43.]

Cloudiness (in tenths).				Wind.												Number of days.												
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
4.3	4.8	3.9	4.8	11,310	56	SE.	NW.	5	8	2	3	5	5	5	59	1	12	12	7	0	14	21	31	0	0	1	J.
6.1	4.1	4.0	4.7	8,625	48	SE.	NW.	19	11	3	6	7	8	6	27	0	10	11	8	0	15	13	28	0	0	2	F.
7.2	5.5	5.2	6.0	9,724	72	E.	NW.	15	11	11	5	4	13	7	25	2	7	14	10	0	16	11	28	0	0	1	M.
4.5	5.7	4.5	4.9	6,441	34	E.	NW.	12	13	8	4	6	12	10	21	4	11	9	10	0	13	1	19	0	0	1	A.
5.5	4.9	4.3	4.9	6,841	36	E.	E.	7	14	24	3	15	13	3	10	4	10	14	7	0	13	0	4	0	0	4	M.
3.6	4.1	3.3	3.6	5,373	34	E.	SW.	6	8	9	3	14	36	6	7	1	13	14	3	0	14	0	0	0	2	1	J.
4.4	.....	3.7	4.0	5,145	36	S.	SW.	8	6	1	1	3	20	11	6	6	12	9	10	4	11	0	0	0	3	0	J.
6.5	.....	4.9	5.7	4,864	48	NE.	SW.	6	5	5	1	2	20	5	14	4	9	7	15	0	14	0	0	0	2	0	A.
5.9	.....	3.9	4.9	5,585	60	E.	SW†.	5	8	4	5	8	12	5	12	1	12	3	15	0	10	0	0	0	0	0	S.
7.1	.....	5.5	6.3	7,562	34	NW.†	NW.	5	10	6	2	5	7	7	18	2	6	8	17	0	15	0	2	0	0	0	O.
5.6	.....	5.2	5.4	9,673	64	NE.	NW.	4	12	3	4	3	13	5	15	1	13	3	14	0	13	4	14	0	0	0	N.
5.9	.....	5.8	5.8	8,564	48	E.	NW.	6	11	2	1	1	12	13	16	0	9	6	16	0	12	10	26	0	0	0	D.
5.6	.....	4.5	5.0	89,707	.. ..	....	NW.	98	117	78	38	73	171	83	230	26	124	110	132	4	160	60	152	0	7	10	Y.

FORT ELLIOTT, TEX.

[*H*=2,700*B*; *T*=14. *h*=2.]

3.2	3.2	1.3	2.6	9,034	48	N.	N.	26	3	1	17	14	11	4	11	6	18	9	4	1	3	8	24	0	0	0	J.
3.7	5.0	3.0	3.9	8,410	48	N.	N.	25	0	2	18	13	11	2	7	9	8	18	3	1	5	0	17	0	0	0	F.
3.4	4.3	1.8	3.2	10,629	64	NW.	N.	25	0	2	7	23	19	2	11	4	17	10	4	0	5	5	17	0	1	0	M.
4.7	5.1	3.6	4.5	10,825	48	SE.†	SE.	13	8	6	21	16	6	2	10	8	10	12	8	0	8	0	0	0	5	0	A.
4.0	3.5	2.7	3.4	10,631	58	N.	S.	15	5	1	16	24	6	4	16	6	15	12	4	0	8	0	0	1	5	0	M.
3.5	3.4	4.1	3.6	11,573	51	S.	SE.	6	5	3	36	24	8	0	2	6	13	13	4	0	5	0	0	13	2	0	J.
2.7	.....	2.1	2.4	7,950	60	NW.	SE.	4	1	2	28	9	3	0	2	13	17	13	1	0	9	0	0	19	4	0	J.
3.7	.....	3.2	3.4	7,464	48	E.	N.	14	1	4	13	7	5	2	8	8	18	6	7	0	12	0	0	13	2	0	A.
1.3	.....	1.1	1.2	6,237	36	S.	SE.	5	6	3	19	8	2	1	5	11	27	1	2	0	2	0	0	5	1	0	S.
3.3	.....	1.7	2.5	8,135	44	N.†	S.	14	4	0	10	15	8	1	3	7	21	4	6	0	3	0	0	0	0	0	O.
5.2	.....	5.0	5.1	7,851	52	NW.	NW.†	8	3	2	10	12	3	3	12	7	11	6	13	0	4	0	11	0	0	0	N.
3.0	.....	2.3	2.6	8,088	38	NW.	NW.	4	1	1	13	7	6	2	26	2	19	7	5	0	4	0	18	0	0	0	D.
3,5	.....	2.7	3.2	106,827	.....	....	SE.	159	37	27	208	172	88	23	113	87	194	111	61	2	68	13	87	51	20	0	Y.

EL PASO, TEX.

[*H*=3,796. *T*=68. *h*=62.]

1.5	2.1	1.9	1.8	2,128	18	NW.†	NW.	3	3	8	8	2	3	8	20	38	23	5	3	0	3	0	17	0	0	0	J.
1.8	3.3	2.9	2.7	2,623	20	NW.†	NW.	5	2	8	10	1	1	14	29	17	15	11	3	0	6	0	2	0	0	0	F.
1.3	2.1	2.4	2.0	3,804	22	W.	W.	2	3	10	10	0	3	28	18	19	21	9	1	0	3	0	3	0	0	0	M.
1.8	1.9	1.2	1.6	4,253	36	N.	W.	9	2	7	12	18	4	24	8	6	24	5	1	0	1	0	0	0	0	0	A.
0.9	1.1	1.1	1.0	6,272	34	NW.	W.	11	8	17	0	0	1	26	20	10	28	3	0	0	2	0	0	3	1	0	M.
0.5	0.6	1.7	0.9	5,823	37	E.	NW.	18	14	11	4	1	0	11	25	6	26	4	0	0	1	0	0	30	1	0	J.
1.8	.....	4.1	3.0	5,830	48	N.	E.	12	15	23	7	3	0	0	1	1	16	9	6	0	8	0	0	30	2	0	J.
1.8	.....	2.3	2.0	5,997	48	NE.	E.	9	9	28	2	1	0	2	11	0	21	6	4	0	5	0	0	25	2	0	A.
1.6	.....	2.0	1.8	3,913	32	NE.	E.	1	15	31	5	1	0	1	0	6	15	9	6	0	9	0	0	7	0	0	S.
1.8	.....	1.8	1.8	5,247	36	NE.	NW.†	11	11	15	0	2	1	1	15	6	19	8	4	0	4	0	0	1	1	0	O.
4.2	.....	3.2	3.7	5,678	36	W.	NE.†	15	9	15	2	0	1	0	15	3	15	5	10	0	7	0	2	0	0	0	N.
1.5	.....	1.4	1.4	5,218	46	NW.	NW.	16	8	4	0	0	0	3	26	5	23	6	2	0	2	0	10	0	0	0	D.
1.7	.....	2.2	2.0	55,791	...	....	NW.	112	99	177	60	29	14	118	188	117	246	80	40	0	51	0	34	96	7	0	Y.

ERIE, PA.

[*H* — 714, *T* — 92. *h* — 82.]

8.4	7.5	8.3	8.1	8,686	48	S.	N. W.	4	9	10	5	12	10	19	24	0	1	10	20	0	24	15	30	0	0	0	J.
6.1	6.1	5.4	5.9	6,750	42	S.	N. W.†	4	6	7	1	20	13	16	20	0	6	12	11	0	9	6	29	0	0	0	F.
6.7	6.6	5.4	6.2	7,879	43	S.	W.	11	13	7	1	12	9	20	18	2	5	14	12	1	16	12	26	0	0	0	M.
4.6	4.9	4.0	4.5	7,007	44	S. W.	N. W.	9	13	11	2	15	6	15	17	2	12	10	8	0	12	0	11	0	4	0	A.
5.6	6.4	4.9	5.7	6,602	30	W.†	S.	4	18	8	2	20	11	17	13	0	3	20	8	0	14	0	0	0	5	2	M.
5.9	5.1	3.5	4.9	6,201	35	S. W.	S.	6	7	7	2	20	13	18	14	3	9	16	5	0	11	0	0	0	7	0	J.
4.1	.....	4.3	4.2	5,880	35	W.	N. W.	3	11	8	2	7	8	10	12	1	12	16	3	0	10	0	0	0	4	0	J.
5.8	.....	4.9	5.4	6,849	27	S.	S. W.	7	6	3	3	15	19	4	4	1	10	10	11	0	10	0	0	0	4	0	A.
5.2	.....	4.3	4.8	7,541	43	S. E.	S.	2	6	6	7	16	10	7	6	0	12	9	9	0	12	0	0	0	3	0	S.
8.8	.....	6.2	7.2	9,320	42	S. E.	N. W.	1	5	1	10	14	11	5	15	0	5	2	24	0	21	0	0	0	1	0	O.
8.1	.....	7.3	7.7	9,641	46	S. E.	S.	4	6	4	7	17	9	8	5	0	3	6	21	0	17	0	10	0	1	0	N.
8.5	.....	7.1	7.8	10,415	36	S.	S.	3	0	1	4	23	12	8	11	0	2	7	22	0	15	8	20	0	0	0	D.
6.4	.....	5.5	6.0	92,771	...	....	S.	58	100	73	46	191	131	147	159	9	80	132	154	1	171	41	126	0	29	2	Y.

Monthly and yearly meteorological summaries—Continued.

EUREKA, CAL.

[Latitude, 40° 48′ N.; longitude, 124°, 11′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Mean. Maximum.	Mean. Mininum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J	29.995	30.52	29.40	40.9	47.5	45.4	44.6	77	20	51.3	37.8	38	41	41	40	89	79	85	84	12.95	3.91
F....	30.080	30.42	29.78	44.6	51.0	48.6	48.1	65	31	54.0	42.7	42	44	44	44	91	78	86	85	1.98	0.80
M....	29.981	30.32	29.56	43.6	50.5	48.9	47.7	68	32	54.5	41.9	40	41	43	41	86	71	80	79	4.09	0.97
A....	30.094	30.28	29.83	47.5	54.0	51.3	50.9	68	39	56.8	46.4	44	46	46	45	87	74	82	81	1.05	0.30
M....	29.935	30.19	29.70	50.2	55.5	53.3	53.0	71	44	57.8	49.2	47	49	49	48	91	79	86	85	0.76	0.30
J.....	29.919	30.22	29.54	54.7	61.9	59.7	58.8	71	47	64.9	53.8	53	55	55	54	93	78	84	85	4.66	1.99
J.....	30.000	30.21	29.80	53.9	....	59.2	56.6	73	48	62.6	53.3	52	.....	54	53	94	.....	82	88	0.44	0.44
A....	29.962	30.16	29.75	54.2	....	57.7	56.0	68	49	61.5	53.2	53	.....	54	53	96	.....	87	91	T.	T.
S.....	29.916	30.07	29.66	53.5	....	59.5	56.5	73	46	63.8	50.9	52	.....	55	54	96	.....	84	90	0.06	0.04
O.....	29.995	30.21	29.82	50.0	....	56.1	53.0	67	40	60.8	48.3	49	.....	52	50	97	.....	86	91	1.15	0.42
N...	29.984	30.24	29.57	46.7	....	53.8	50.2	70	35	58.1	44.4	44	.....	48	46	91	.....	83	87	3.41	1.18
D....	29.914	30.22	29.48	51.0	....	54.9	53.0	66	38	58.1	46.2	47	.....	49	48	87	.....	81	84	5.93	1.71
Y....	29.981	30.52	29.40	49.2	....	54.0	52.4	77	20	58.7	47.8	47	.....	49	48	92	.....	84	86	36.5	....

FORT SMITH, ARK.

[Latitude, 35° 22′ N.; longitude, 94° 24′ W.]

J.....	29.765	30.26	29.29	28.5	40.8	35.5	34.9	71	1	44.8	25.4	22	26	27	25	78	57	71	69	1.22	0.64
F....	29.575	30.09	29.14	38.1	50.3	45.2	44.5	70	16	53.7	36.5	32	34	36	34	79	57	70	69	1.77	0.75
M ...	29.597	30.11	29.02	39.5	54.2	49.6	47.8	84	23	59.7	38.3	33	35	36	34	77	53	61	64	3.09	0.87
A....	29.601	29.89	29.22	56.5	72.8	65.6	65.0	90	42	76.3	55.4	48	49	51	49	73	46	61	60	7.21	3.40
M ...	29.414	29.71	29.18	59.5	75.3	68.2	67.7	88	44	79.2	57.7	54	58	59	57	83	56	73	71	5.49	2.10
J....	29.434	29.69	29.20	69.8	82.1	76.2	76.0	93	56	86.2	67.4	96	66	68	67	87	62	76	75	7.67	1.64
J....	29.532	29.71	29.39	75.7	....	85.6	80.6	100	63	92.6	71.4	71	.....	72	72	85	.....	66	76	4.31	1.51
A....	29.487	29.76	29.28	74.0	....	82.2	78.1	100	64	89.5	70.5	68	.....	71	70	82	.....	70	76	6.26	2.40
S.....	29.584	29.90	29.43	62.3	....	73.9	68.1	93	48	82.9	59.8	58	.....	61	60	87	.....	65	76	.50	0.33
O....	29.548	29.83	29.27	50.8	....	61.7	56.2	84	34	71.4	48.4	46	.....	48	47	85	.....	63	74	3.57	1.97
N....	29.638	29.96	29.19	43.5	....	50.5	47.0	79	28	56.8	40.9	38	.....	40	39	82	.....	69	75	5.54	2.54
D....	29.668	29.97	29.14	36.5	....	46.6	41.6	68	22	53.1	34.6	31	.....	35	33	82	.....	65	74	4.31	1.98
Y ...	29.570	30.26	29.02	52.9	....	61.7	59.0	100	1	70.5	50.5	47	.. ..	50	49	82	.....	68	72	51.00	....

FRESNO, CAL.

[Latitude, 36° 43′ N.; longitude, 119° 49′ W.]

J	29.800	30.25	29.26	38.3	48.3	45.7	44.1	68	20	53.0	35.2	35	39	40	38	89	72	82	81	1.75	0.95
F....	29.742	29.96	29.46	43.3	59.9	56.3	53.2	83	30	65.5	40.4	41	47	45	44	91	63	68	74	0.13	0.13
M ...	29.688	30.11	29.26	44.1	60.5	57.8	51.1	77	28	65.5	41.6	42	46	48	45	91	61	72	75	1.95	1.05
A....	29.680	29.89	29.40	53.0	75.2	73.1	67.1	98	41	81.9	50.3	47	52	49	49	81	45	44	57	0.22	0.20
M ...	29.565	29.75	29.39	55.3	75.4	75.1	68.6	96	46	82.6	53.4	49	53	52	51	81	47	46	58	0.56	0.31
J	29.558	29.75	29.34	60.1	80.6	81.5	74.1	104	50	88.2	58.5	52	55	54	53	74	42	39	52	T.	T.
J	29.561	29.86	29.42	64.6	....	96.7	80.6	109	54	99.5	63.9	51	.....	57	54	63	.....	28	45	T.	T.
A ...	29.508	29.71	29.30	66.1	....	99.8	83.0	111	56	101.5	64.6	50	....	55	58	58	.....	23	41	T.	T.
S	29.510	29.72	29.25	66.1	....	94.5	80.3	111	54	97.6	63.8	54	.....	59	56	66	.....	32	49	0.06	0.06
O ...	29.598	29.79	29.40	53.1	... .	79.4	66.2	94	41	82.3	50.7	46	.....	53	49	77	.....	41	59	0.00	0.00
N ...	29.685	29.86	29.39	47.0	....	60.4	53.7	78	35	64.6	44.0	42	.....	50	46	85	.....	73	79	2.38	1.33
D ...	29.751	29.99	29.20	44.3	....	51.4	47.8	66	35	54.2	42.1	44	.....	48	46	97	.....	88	93	1.71	0.71
Y ...	29.637	30.25	29.20	52.9	....	72.6	64.4	111	20	78.0	50.7	46	.....	51	49	80	.....	53	64	8.76	.....

GALVESTON, TEX.

[Latitude, 29° 18′N.; longitude, 94° 47′ W.]

J	30.217	30.64	29.87	47.4	51.5	50.6	49.8	68	23	56.0	44.5	45	47	48	47	93	86	90	89	2.70	.61
F ...	30.018	30.43	29.70	57.0	60.7	58.6	58.8	72	40	63.1	53.9	53	52	53	53	88	77	82	82	7.54	3.79
M ...	30.056	30.48	29.60	57.8	62.9	59.7	60.1	75	42	65.3	54.5	53	53	53	53	85	71	78	78	2.84	1.93
A ...	30.057	30.26	29.87	69.5	73.3	70.9	71.2	78	56	75.3	67.7	66	66	67	67	90	79	88	86	3.13	1.67
M ...	29.882	30.04	29.68	72.6	77.4	74.5	74.8	86	62	79.7	70.1	67	67	67	67	83	72	79	78	5.18	1.81
J	29.892	30.19	29.71	78.5	82.5	79.6	80.2	90	69	84.5	76.2	73	73	73	73	83	74	81	79	9.77	6.40
J	29.980	30.08	29.74	80.9	....	83.2	82.0	91	74	87.4	78.6	74	.....	73	74	81	.....	72	76	1.54	.92
A ...	29.926	30.12	29.67	80.5	....	83.3	81.9	94	71	87.5	77.8	75	.....	74	74	82	.....	74	78	14.46	5.94
S	29.967	30.25	29.86	75.2	....	79.8	77.5	87	65	83.0	73.4	70	.....	69	70	83	.....	71	77	3.32	2.59
O....	29.977	30.22	29.80	71.2	....	73.3	72.2	85	54	77.4	68.8	65	.....	65	65	81	.....	77	79	5.67	3.04
N ...	30.060	30.31	29.60	59.6	....	61.6	60.6	82	42	66.7	56.4	56	.....	55	56	88	.....	81	85	6.73	3.58
D ...	30.110	30.42	29.72	55.0	....	58.2	56.6	71	40	62.0	52.7	50	.....	52	51	85	.....	81	83	3.00	1.23
Y ...	30.012	30.64	29.60	67.1	....	69.4	68.8	94	23	74.0	64.6	62	.....	62	62	85	.....	80	81	65.9	....

Monthly and yearly meteorological summaries—Continued.

EUREKA, CAL.

[*H*=64. *T*=60. *h*=52.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.3	7.6	5.2	6.4	5,052	36	SW.†	SE.	12	10	12	25	11	8	6	3	6	7	10	14	0	19	0	11	0	0	0	J.
5.5	6.4	4.9	5.6	4,224	36	N.	N.	23	7	3	8	4	12	13	6	13	6	13	10	0	10	0	1	0	0	0	F.
5.5	5.7	6.4	5.9	7,027	36	SE.†	N.	36	6	3	16	7	14	4	7	0	10	7	14	0	13	0	0	0	0	0	M.
6.5	6.0	5.9	6.1	4,240	33	SW.	N.	32	4	3	7	2	7	8	19	8	6	15	9	0	10	0	0	0	0	0	A.
7.4	7.1	7.2	7.2	5,014	36	N.	N.	36	2	1	5	4	11	14	16	4	4	11	16	0	7	0	0	0	1	0	M.
7.4	7.5	6.8	7.2	4,507	34	N.	N.	19	0	3	11	5	16	14	16	6	3	12	15	0	15	0	0	0	0	0	J.
6.5	.....	4.2	5.4	5,265	36	NW.	N.	19	0	5	2	2	11	9	12	2	14	8	9	0	2	0	0	0	0	0	J.
4.8	.....	4.0	4.4	3,434	24	N.	N.	21	1	1	2	2	12	9	9	5	9	8	14	4	0	0	0	0	0	0	A.
4.4	.....	5.3	4.8	3,565	36	N.	N.	22	3	2	6	1	10	3	7	6	14	7	9	1	3	0	0	0	0	0	S.
2.8	.....	4.4	3.6	3,177	38	N.	N.	19	1	1	7	1	7	5	5	16	12	13	6	1	8	0	0	0	0	0	O.
5.0	.....	5.5	5.2	2,809	34	N.	N.	12	11	3	8	3	7	3	1	12	8	7	15	0	14	0	0	0	0	0	N.
6.6	.....	7.9	7.2	3,762	34	SW.	SE.	3	6	7	17	7	5	5	0	12	2	5	24	0	16	0	0	0	0	0	D.
5.7	.....	5.6	5.8	52,076	.....	....	N.	254	51	44	116	52	116	84	107	90	95	116	155	6	117	0	12	0	1	0	Y.

FORT SMITH, ARK.

[*H*=470. *T*=54. *h*=48.]

5.6	5.5	5.2	5.4	4,211	27	SW.	E.	7	7	22	17	3	8	17	12	0	9	11	11	0	7	7	22	0	0	0	J.
5.6	6.2	5.4	5.7	3,784	24	NW.†	E.	9	11	18	15	6	8	8	10	2	6	13	10	0	11	0	7	0	0	0	F.
6.1	5.1	3.9	5.0	4,775	30	NW.	SE.	15	7	12	18	10	10	12	7	2	11	11	9	0	10	0	9	0	3	0	M.
4.6	4.2	3.2	4.0	4,311	24	SW.	SE.	3	7	18	26	11	12	7	5	1	16	5	9	0	10	0	0	0	1	0	A.
3.8	4.8	3.6	4.1	3,810	21	NE.†	SE.	5	11	12	25	8	11	8	10	3	12	14	5	0	9	0	0	0	2	0	M.
5.0	4.8	2.9	4.2	3,066	25	SE.	SE.	6	4	12	28	14	11	7	6	2	11	15	4	0	14	0	0	6	3	0	J.
2.8	.....	3.4	3.1	1,949	21	SW.	SE.	1	4	13	16	6	10	5	3	4	14	11	6	0	8	0	0	23	3	0	J.
5.2	.....	5.1	5.2	2,819	24	NE.†	SE.	2	5	12	27	5	8	3	0	0	9	5	17	0	11	0	0	15	6	0	A.
2.6	.....	1.7	2.2	2,182	18	SE.	SE.	2	14	10	16	3	4	5	1	5	21	8	1	0	3	0	0	4	1	0	S.
3.7	.....	3.0	3.4	3,454	18	W.	SE.	12	8	6	19	4	3	9	1	0	21	4	6	0	9	0	0	0	4	0	O.
7.3	.....	6.3	6.8	3,297	27	NW.	SE.	3	3	8	24	3	1	4	11	3	8	4	18	0	11	0	4	0	1	0	N.
4.3	.....	4.2	4.2	3,527	18	NW.†	SE.	11	5	6	19	4	0	6	7	4	15	6	10	0	10	0	14	0	0	0	D.
4.7	.....	4.0	4.4	41,185	.....	....	SE.	76	86	149	250	77	86	91	73	26	153	107	106	0	113	7	56	48	24	0	Y.

FRESNO, CAL.

[*H*=313. *T*=46. *h*=35.]

4.1	5.2	3.3	4.2	2,887	18	N.†	E.	8	6	19	7	18	4	12	12	7	13	11	7	0	6	0	12	0	0	0	J.
1.8	3.1	1.1	2.0	2,674	18	N.†	N.	21	3	11	8	17	3	5	15	4	21	8	0	0	1	0	0	0	0	0	F.
2.0	4.8	2.4	3.1	3,590	24	SE.	NW.	18	4	6	17	11	2	9	19	7	18	10	3	0	8	0	1	0	0	0	M.
1.0	2.3	2.0	1.7	3,857	20	NW.†	NW.	27	0	6	4	4	0	12	36	1	23	7	0	0	2	0	0	8	0	0	A.
1.9	2.5	2.5	2.3	4,502	20	NW.	NW.	12	1	2	1	3	7	27	40	0	21	9	1	0	5	0	0	6	1	0	M.
1.9	1.5	1.4	1.6	5,767	18	W.†	NW.	12	0	0	1	3	1	11	61	1	21	9	0	0	0	0	0	12	0	0	J.
0.8	.....	1.5	1.2	4,425	20	NW.	NW.	19	0	3	1	6	1	7	25	0	27	2	2	0	0	0	0	28	0	0	J.
1.0	.....	0.7	0.8	3,996	18	NW.	NW.	15	0	0	1	3	3	9	31	0	30	0	1	0	0	0	0	29	0	0	A.
1.3	.....	1.1	1.2	3,561	24	NW.	NW.	10	2	3	4	1	3	7	30	0	23	6	1	0	1	0	0	24	1	0	S.
0.2	.....	1.2	0.7	2,976	15	N.	NW.	16	1	5	5	3	1	3	24	4	27	4	0	0	0	0	0	3	0	0	O.
2.6	.....	3.6	3.2	2,248	18	S.	NW.	7	4	7	11	6	4	4	12	5	14	6	10	1	7	0	0	0	1	0	N.
2.9	.....	4.3	3.6	2,136	15	E.	W.	5	3	8	10	9	7	11	7	2	11	10	10	5	5	0	0	0	0	0	D.
1.8	.....	2.1	2.1	42,619	.....	....	NW.	170	24	70	70	84	36	117	312	31	249	82	35	6	35	0	13	110	3	0	Y.

GALVESTON, TEX.

[*H*=42. *T*=84. *h*=79.]

6.4	7.4	5.1	6.3	7,517	38	N.	N.	27	11	13	14	22	1	1	2	2	9	8	14	0	14	0	3	0	0	0	J.
5.5	6.4	3.7	5.2	6,803	30	N.	S.	13	16	18	4	26	1	5	3	1	8	14	7	0	12	0	0	0	3	0	F.
6.3	5.8	4.3	5.5	8,543	50	N.	S.	22	10	9	15	31	4	0	1	1	7	14	10	0	8	0	0	0	4	0	M.
6.4	5.3	4.2	5.3	9,109	36	SE.†	S.	4	4	5	27	46	3	0	1	0	6	18	6	0	9	0	0	0	4	0	A.
5.5	5.1	3.5	4.7	8,751	48	NE.	S.	6	14	9	16	38	8	0	2	0	9	15	7	0	9	0	0	0	7	0	M.
5.7	5.9	3.1	4.9	8,706	54	SE.	S.	0	0	4	27	42	10	5	2	0	8	15	7	0	10	0	0	0	3	0	J.
3.7	.....	3.5	3.6	6,851	42	E.	SW.	0	2	7	7	11	24	4	4	3	18	7	6	0	6	0	0	1	2	0	J.
6.1	.....	5.5	5.8	7,293	36	NE.	SE.†	5	1	7	12	12	11	7	5	2	6	13	12	0	13	0	0	3	3	0	A.
5.4	.....	5.3	5.4	7,166	30	NE.	NE.	5	23	6	18	3	1	0	3	1	9	11	10	0	4	0	0	0	1	0	S.
5.1	.....	3.5	4.3	8,248	40	NE.	S.	10	8	8	11	15	9	1	0	0	13	11	7	0	8	0	0	0	1	0	O.
5.5	.....	4.7	5.1	6,661	37	NW.	NE.	9	14	7	8	12	1	1	7	1	12	6	12	0	9	0	0	0	2	0	N.
4.6	.....	3.1	3.8	6,285	26	N.	SE.	8	8	8	14	8	6	2	8	0	21	2	8	0	10	0	0	0	1	0	D.
5.5	.....	4.1	5.0	91,933	.....	....	S.	109	111	101	173	266	79	26	38	11	126	134	106	0	112	0	3	4	31	...	Y.

Monthly and yearly meteorological summaries—Continued.

GRAND HAVEN, MICH.

[Latitude, 43° 5′ N.; longitude, 86° 18′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	7 a.m.	3 p.m.	10 p.m.	Mean.	Total.	Max. 24 hours.
	In.	*In.*	*In.*	°	°	°	°	°	°	°	°	°	°	°	°					*In.*	*In.*
J....	29.486	30.12	28.75	15.6	18.4	16.9	17.0	40	-5	23.5	11.8	13	14	15	14	89	85	90	88	2.20	.76
F.	29.325	30.16	28.46	18.2	23.6	21.8	21.2	44	-7	29.3	14.1	16	19	18	18	91	82	88	87	1.45	.50
M...	29.408	29.82	28.76	21.7	27.1	24.5	24.4	64	1	32.0	17.8	18	20	20	19	86	74	84	81	2.40	.65
A....	29.453	29.80	28.84	37.7	44.9	42.0	41.5	74	23	49.9	34.4	30	31	31	31	75	60	68	68	1.54	.69
M...	29.250	29.64	28.88	46.5	53.2	50.5	50.1	78	30	58.5	42.1	39	41	41	40	77	65	72	72	3.01	.80
J....	29.267	29.60	29.00	60.5	65.5	63.6	63.2	90	39	71.3	55.6	54	54	55	54	80	67	74	74	1.48	.74
J....	29.368	29.55	29.14	66.1	....	69.8	67.9	84	49	75.8	60.1	58	.....	58	58	74	.....	68	71	1.59	.78
A...	29.354	29.63	29.09	63.2	....	65.6	61.4	80	46	71.6	58.1	56	.....	56	56	79	.....	73	76	2.59	.81
S....	29.377	29.68	28.92	52.3	....	57.4	54.8	74	37	63.1	47.2	47	.....	48	48	83	.....	73	78	2.58	.93
O...	29.287	29.69	28.75	43.7	....	47.0	45.4	64	33	52.1	39.4	38	.....	38	38	81	.....	73	77	2.00	.68
N....	29.441	29.97	28.90	37.0	....	40.1	38.6	72	18	44.5	33.7	32	.....	32	32	82	.....	75	78	3.06	1.62
D....	29.356	29.77	28.75	30.9	....	33.2	32.0	50	17	37.0	27.6	26	.....	26	26	81	.....	74	78	2.06	.79
Y....	29.365	30.16	28.46	41.1	....	44.4	43.4	90	-7	50.7	36.8	36	.....	37	36	82	.....	76	77	26.0	....

FORT GRANT, ARIZ.

[Latitude, 32° 39′ N.; longitude, 109° 57′ W.]

J....	25.214	25.52	24.98	35.2	51.8	42.9	43.3	67	19	55.1	33.5	19	25	24	22	54	37	47	46	.12	.06
F....	25.154	25.34	24.89	39.0	55.0	46.9	47.0	68	29	57.1	37.4	24	30	23	28	55	40	50	48	.44	.21
M...	25.145	25.40	24.87	39.7	56.1	48.9	48.2	71	27	59.7	37.7	22	24	24	23	50	32	40	41	.83	.30
A...	25.244	25.42	25.05	53.8	70.2	60.6	61.5	82	41	73.0	50.8	25	30	31	29	34	24	33	31	.50	.50
M...	25.154	25.34	25.06	55.6	73.3	64.3	64.4	86	44	76.3	52.7	29	31	31	31	38	25	30	31	.18	.18
J....	25.173	25.31	25.02	66.5	85.0	74.8	75.4	92	58	87.8	63.8	26	35	31	31	22	18	20	20	.02	.02
J....	25.272	25.42	25.16	71.3	....	81.2	76.3	98	60	90.1	68.2	31	.....	47	39	24	.....	34	29	4.27	1.18
A....	25.268	25.42	25.17	70.5	....	84.9	77.7	96	60	90.8	67.4	38	.....	46	42	31	.....	27	29	.52	.50
S....	25.274	25.41	25.14	66.9	....	77.7	72.3	91	53	83.1	62.2	39	.....	45	42	37	.....	33	35	.78	.76
O...	25.216	25.40	25.08	57.6	....	68.3	63.0	87	38	75.1	54.1	36	.....	39	37	46	.....	39	42	1.19	.93
N...	25.204	25.38	25.01	45.9	....	52.3	49.1	73	30	59.2	42.5	32	.....	32	32	64	.....	51	57	3.67	1.88
D...	25.236	25.53	25.00	39.0	....	45.5	42.8	62	30	53.6	35.7	30	.....	34	32	72	.....	62	67	1.68	.60
Y...	25.215	25.53	24.87	53.4	....	62.4	60.1	98	19	71.7	50.5	29	.....	34	32	44	.....	39	40	14.2	....

GREEN BAY, WIS.

[Latitude, 44° 31′ N.; longitude, 88° 0′ W.]

J....	29.527	30.16	28.62	0.5	10.2	5.8	5.5	36	-36	14.5	-4.2	-3	5	3	2	86	80	88	84	2.38	0.87
F...	29.344	30.22	28.57	10.6	19.8	15.1	15.2	43	-27	23.7	5.8	8	15	12	12	89	82	90	87	2.11	0.62
M...	29.430	29.92	28.78	14.5	25.5	20.8	20.3	44	-8	28.2	10.9	11	18	18	16	88	74	90	84	5.69	2.80
A...	29.469	29.87	28.94	35.2	44.3	38.7	39.4	82	21	47.3	31.6	32	31	34	32	88	63	86	79	2.90	1.24
M...	29.255	29.74	28.82	45.9	55.2	48.0	49.7	78	28	58.4	40.6	41	43	43	42	85	67	83	78	3.79	0.69
J....	29.250	29.64	28.92	63.1	73.0	65.0	67.0	92	38	76.4	56.6	56	57	59	57	79	59	80	73	1.14	0.69
J....	29.330	29.54	29.17	67.0	....	71.7	69.4	90	52	79.7	59.9	59	.....	60	60	76	.....	69	72	3.13	1.16
A...	29.344	29.64	29.04	61.8	....	67.7	64.8	89	40	75.8	56.3	56	.....	58	57	83	.....	71	77	2.39	0.87
S...	29.370	29.72	28.81	52.6	....	58.5	55.6	80	32	66.2	47.7	48	.....	49	49	85	.....	72	79	5.36	3.98
O...	29.292	29.71	28.79	41.2	....	44.8	43.0	69	25	51.6	37.5	37	.....	40	38	85	.....	85	85	1.45	0.64
N...	29.469	30.03	29.02	33.0	....	37.2	35.1	64	9	42.3	30.2	29	.....	32	30	86	.....	82	84	2.12	1.15
D...	29.353	29.81	28.56	24.5	....	29.1	26.8	49	5	32.4	21.3	20	.....	23	22	84	.....	78	81	3.01	0.85
Y...	29.373	30.22	28.56	37.5	....	41.9	41.0	92	-36	49.7	32.8	33	.....	36	34	84	.....	81	80	35.5	....

HARRISBURG, PA.

[Latitude, 40° 16′ N.; longitude, 76° 52′ W.]

J....	....	....	....	....	....	....	....	.....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
F...	....	....	....	....	....	....	....	.....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
M...	....	....	....	....	....	....	....	.....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
A....	....	....	....	....	....	....	....	.....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
M...	....	....	....	....	....	....	....	.....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
J....	....	....	....	....	....	....	....	.....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
J...	29.658	29.85	29.31	68.6	....	74.5	71.5	91	54	81.5	68.0	60	.....	63	61	74	.....	69	72	3.27	1.40
A...	29.630	29.90	29.08	68.6	....	74.2	71.4	95	51	82.1	63.7	62	.....	64	63	80	.....	71	76	6.28	4.70
S....	29.668	30.19	29.28	58.6	....	62.1	60.4	81	36	68.1	55.2	53	.....	55	54	83	.....	80	81	4.47	1.63
O...	29.612	29.99	29.06	45.4	....	49.7	47.6	69	35	55.5	42.2	39	.....	40	40	79	.....	72	76	2.04	0.39
N...	29.764	30.34	29.13	40.9	....	44.9	42.9	74	19	50.4	36.8	34	.....	37	36	79	.....	74	77	2.31	0.75
D...	29.634	30.22	28.68	31.5	....	35.4	33.4	54	11	40.1	28.2	24	.....	26	25	76	.....	70	73	2.50	1.20
Y....	....	....	....	....	....	....	....	.....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....

Monthly and yearly meteorological summaries—**Continued.**

GRAND HAVEN, MICH.

[*H*=620. *H*=86. *h*=75.]

Cloudiness (in tenths)*				Wind.												Number of days—											
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and years.
8.7	9.2	9.4	9.1	8,697	52	SW.	SE.	13	9	16	18	3	10	7	17	0	0	7	24	0	23	27	31	0	0	0	J.
8.5	7.6	7.3	7.8	7,821	36	W.	W.	10	2	16	12	14	6	20	7	0	1	10	18	0	13	13	29	0	0	0	F.
8.1	7.2	5.3	6.9	9,801	42	NW.	NW.	12	11	12	13	5	6	14	20	0	3	13	15	0	13	15	30	0	0	1	M.
5.7	5.9	4.3	5.3	8,820	36	NW.†	NW.	10	7	13	9	14	6	8	23	0	9	10	11	0	8	0	12	0	2	2	A.
5.9	6.8	6.4	6.4	7,526	30	SW.	W.	4	7	15	14	14	10	17	12	0	7	10	14	0	15	0	1	0	5	1	M.
5.5	5.8	5.7	5.6	7,183	36	S.	SW.	3	4	10	8	19	20	14	12	0	7	12	11	0	6	0	0	1	3	0	J.
5.6	.....	5.8	5.7	5,802	30	NE.	NW.	3	9	4	11	8	8	7	12	0	10	12	9	0	9	0	0	0	5	0	J.
5.4	......	4.9	5.2	7,380	36	W.	S.	5	6	8	4	12	10	6	11	0	13	11	7	0	10	0	0	0	6	0	A.
5.2	... .	3.5	4.4	6,773	39	W.	SW.	8	4	6	10	4	12	7	8	1	12	7	11	0	12	0	0	0	4	0	S.
7.5	.....	6.3	6.9	9,198	42	NW.†	NE.	11	13	7	7	8	1	8	7	0	10	2	19	0	13	0	3	0	2	0	O.
5.9	......	6.5	6.2	8,573	36	W.†	NE.	9	11	7	5	10	6	3	9	0	8	9	13	0	12	1	14	0	1	0	N.
8.9	.....	6.5	7.7	11,169	48	SW.	NE.	7	11	4	6	10	10	9	5	0	1	11	19	0	9	8	25	0	0	0	D.
6.7	....	6.0	6.4	98,743	......	....	NE.†	95	94	118	117	121	107	120	143	1	81	114	171	0	143	64	145	1	28	4	Y.

FORT GRANT, ARIZ.

[*H*=4,916 B. *T*=15. *h*=4.]

7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and years.
3.9	3.8	4.3	4.0	4,512	48	W.	N.	22	8	2	10	7	8	16	19	1	12	14	5	0	2	0	14	0	0	0	J.
4.4	3.9	3.8	4.1	4,972	36	SE.	NW.	13	12	8	6	7	8	14	19	0	10	15	4	0	7	0	3	0	0	0	F.
3.3	3.7	3.2	3.4	3,461	48	SE.	W.	15	8	8	8	7	9	19	18	1	14	12	5	0	5	0	4	0	0	0	M.
2.5	3.8	2.5	3.0	5,024	40	SE.	N.	23	11	10	10	5	5	9	17	0	17	10	3	0	1	0	0	0	1	0	A.
1.2	2.2	1.6	1.7	4,384	30	E.	NW.	14	10	5	6	9	11	14	24	0	25	4	2	0	2	0	0	0	0	0	M.
1.1	2.1	1.3	1.5	3,739	24	W.†	NW.	16	10	3	4	4	6	17	30	0	24	4	2	0	1	0	0	6	0	0	J.
3.7	.....	6.7	5.2	4,120	42	SE.	NW.†	12	9	10	6	2	2	7	12	2	7	12	12	0	16	0	0	17	13	0	J.
1.5	.....	2.9	2.2	4,152	30	SE.	NW	10	6	8	9	0	3	11	15	0	22	8	1	0	2	0	0	19	1	0	A.
1.6	.....	2.6	2.1	5,763	30	W.†	SE.	5	5	12	23	3	0	5	7	0	22	4	4	0	3	0	6	1	0	0	S.
1.7	.....	2.3	2.0	3,376	30	S.	NW.	12	13	6	4	1	1	4	15	6	22	5	4	0	3	0	0	0	1	0	O.
3.7	.....	4.2	4.0	5,057	36	E.†	NE.	11	14	10	8	3	1	0	13	0	15	6	9	0	9	0	1	0	0	0	N.
3.5	.....	3.0	3.2	4,014	40	E.	N.	14	9	12	2	3	1	9	11	1	17	6	8	0	5	0	4	0	0	0	D.
2.7	.....	3.2	3.0	52,574	.....	....	NW.	167	115	94	96	51	55	125	200	11	207	100	59	0	56	0	26	43	16	0	Y.

GREEN BAY, WIS.

[*H*=616. *T*=50. *h*=41.]

7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and years.
6.3	6.5	5.9	6.2	5,396	30	W.	SW.	10	10	2	3	5	35	14	12	2	5	14	12	0	16	29	31	0	0	1	J.
7.4	6.8	6.6	7.0	4,921	27	NE.	S.	9	7	1	4	34	10	9	7	6	6	8	15	0	12	18	29	0	0	1	F.
5.9	7.1	5.4	6.1	6,165	32	W.	NE.	16	21	5	12	16	4	14	4	1	6	10	15	0	11	18	30	0	0	0	M.
6.5	7.0	5.6	6.4	6,511	36	NE.†	N.	16	13	5	15	13	6	8	12	2	4	13	13	0	10	0	17	0	1	2	A.
6.9	8.2	6.7	7.3	6,083	24	SW.†	SE.†	20	11	9	20	11	7	10	4	1	2	13	16	0	14	0	4	0	1	0	M.
6.0	7.7	4.7	6.1	5,784	26	S.	S.	8	8	7	18	33	10	3	3	0	5	15	10	0	7	0	0	3	3	0	J.
6.4	.....	6.1	6.2	4,835	36	W.	S.	6	11	9	10	17	6	2	1	0	3	16	12	0	9	0	0	1	5	0	J.
5.7	.....	4.6	5.2	5,454	42	SW.	S.	6	7	6	8	17	11	3	2	2	8	13	10	0	9	0	0	0	2	1	A.
4.5	.....	5.3	4.9	5,343	36	NW.	S.	9	3	6	8	13	5	8	8	0	9	11	10	0	11	0	0	0	1	0	S.
7.2	.....	6.6	6.9	6,097	30	N.	N.	11	5	7	10	10	9	2	8	0	4	10	17	0	10	0	5	0	0	0	O.
7.0	.....	6.1	6.6	5,282	32	N.	S.	13	1	3	5	15	4	4	9	6	3	15	12	0	6	2	16	0	2	0	N.
7.8	.....	6.1	7.0	6,988	34	N.	S.	5	2	0	3	26	4	10	9	3	5	10	16	0	8	13	30	0	0	0	D.
6.5	.....	5.8	6.3	68,859	.....	....	S.	129	99	60	116	210	111	87	79	23	60	148	158	0	123	80	162	4	15	5	Y.

HARRISBURG, PA.

[*H*=361. *T*=94. *h*=87.]

7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and years.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	J.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	F.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	M.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	A.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	M.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	J.
4.5	.....	5.0	4.8	3,885	24	NW.	W.	10	3	3	3	14	9	15	5	0	10	10	11	0	7	0	0	1	0	0	J.
5.1	.....	4.1	4.6	4,074	28	N.	W.	8	3	2	1	8	8	18	9	5	11	10	10	0	12	0	0	4	1	0	A.
5.8	.....	6.1	6.0	3,773	23	NW.	NW.†	12	7	7	5	2	1	10	12	4	3	11	16	0	9	0	0	0	0	0	S.
6.6	.....	5.3	6.0	5,534	30	NW.	NW.	2	5	5	9	4	6	10	20	1	8	7	16	0	16	0	0	0	0	0	O.
6.6	.....	6.1	6.4	5,308	36	NW.†	NE.	7	12	5	10	0	3	10	11	2	7	7	16	0	11	1	9	0	0	0	N.
6.3	.....	4.2	5.2	6,230	42	N.	NW.	5	7	3	3	1	14	8	19	2	8	8	15	0	7	5	20	0	0	0	D.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	Y.

Monthly and yearly meteorological summaries—Continued.

HATTERAS, N. C.

[Latitude, N. 35° 15′; longitude, 75° 40′ W.]

Months and year.	Pressure.			Temperature.								Dewpoint.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
	In.	*In.*	*In.*	°	°	°	°	°	°	°	°	°	°	°	°					*In.*	*In.*
J....	30.232	30.73	29.77	42.5	46.5	45.1	44.7	69	22	53.5	38.7	38	40	42	40	85	79	88	84	4.85	1.80
F....	30.114	30.61	29.63	43.8	49.4	45.7	46.3	66	27	53.1	40.7	40	44	43	42	89	83	90	87	3.83	1.40
M...	30.127	30.48	29.58	45.8	50.8	47.3	48.0	69	26	54.5	41.4	42	46	44	44	87	85	90	87	5.07	1.78
A....	30.186	30.62	29.76	56.6	59.8	55.4	57.3	75	41	64.0	49.8	51	51	51	51	82	73	85	80	.77	0.40
M...	30.025	30.30	29.82	65.8	68.7	65.7	66.7	77	49	72.2	61.4	63	64	64	64	90	85	93	89	7.27	4.18
J....	29.998	30.34	29.75	72.5	75.5	71.3	73.1	83	59	77.6	68.0	68	69	68	68	86	82	90	86	4.39	1.84
J....	30.060	30.26	29.78	75.4	....	73.7	74.6	85	62	80.1	69.9	70	.....	69	69	83	.....	85	84	6.24	2.51
A....	30.088	30.25	29.85	77.9	....	76.9	77.4	88	62	82.3	73.5	72	.....	72	72	82	.....	86	84	2.36	0.95
S....	30.060	30.27	29.61	72.8	....	72.3	72.6	84	50	77.4	69.2	68	.....	68	68	85	.....	88	86	6.63	1.85
O....	30.062	30.43	29.63	60.7	....	60.9	60.8	76	48	66.4	56.1	53	.....	55	54	77	.....	82	79	3.99	1.90
N...	30.119	30.54	29.56	56.8	....	56.9	56.8	74	38	61.6	53.1	53	.....	53	53	87	.....	88	88	5.52	2.04
D....	30.156	30.62	29.40	44.1	....	46.5	45.3	65	28	51.5	40.9	40	.....	42	41	87	.....	85	86	5.81	3.76
Y....	30.102	30.73	29.40	59.6	....	59.8	60.3	88	22	66.2	55.2	55	.....	56	54	85	.....	87	85	56.7	....

HELENA, MONT.

[Latitude, 46° 34′ N.; longitude, 112° 4′ W.]

J....	25.837	26.30	25.30	1.1	7.1	7.6	5.3	56	-41	17.9	-3.9	-9	-4	-4	-6	68	65	64	66	.79	0.43
F...	25.805	26.12	25.37	32.3	38.4	34.4	35.0	56	-1	43.0	26.8	17	17	16	17	54	44	50	50	.12	0.09
M...	25.792	26.10	26.44	17.5	27.2	24.8	23.2	64	-13	33.2	14.5	6	11	12	10	61	55	60	59	1.32	0.52
A....	25.845	26.33	25.40	40.2	55.3	51.0	48.8	78	28	60.4	38.2	25	22	27	25	57	33	43	44	.56	0.20
M...	25.792	26.12	25.43	42.6	56.1	51.6	50.1	78	32	60.5	41.5	35	39	37	37	77	54	60	64	2.96	1.08
J....	25.725	25.97	25.44	51.8	64.5	60.0	58.8	90	40	69.0	50.2	42	44	44	43	70	49	57	59	1.87	0.38
J....	25.896	26.17	25.65	58.4	....	75.8	67.1	99	46	81.0	55.3	42	.....	38	40	56	.....	30	43	.89	0.22
A....	25.914	26.07	25.75	55.2	....	75.4	65.3	93	42	80.0	53.3	40	.....	38	39	59	.....	30	45	.26	0.18
S....	25.926	26.31	25.59	51.2	....	71.2	61.2	89	41	76.0	49.1	33	.....	32	33	52	.....	26	39	.14	0.08
O ...	25.811	26.05	25.34	41.8	....	51.5	46.6	75	21	57.2	39.2	26	.....	25	26	55	.....	39	47	.14	0.04
N....	25.846	26.14	25.48	20.0	....	28.3	24.2	57	-4	32.6	16.8	10	.....	16	13	66	.....	61	64	.32	0.12
D....	25.872	26.36	25.45	20.8	....	26.5	23.6	53	-14	31.7	18.1	8	.....	13	11	59	.....	57	58	.77	0.48
Y....	25.842	26.36	25.30	36.1	....	46.5	42.4	99	-41	53.5	33.3	23	.....	25	24	61	.....	48	53	10.1	....

HURON, DAK.

[Latitude, 44° 21′ N.; longitude, 98° 9′ W.]

J.....	28.793	29.29	28.21	-6.6	3.7	-1.2	-1.4	40	-36	9.5	-12.1	-9	0	-4	-4	91	84	87	88	0.78	0.26
F....	28.638	29.38	28.14	9.6	18.6	13.7	14.0	45	-32	24.9	4.3	6	12	9	9	86	77	82	82	0.52	0.26
M...	28.689	29.21	28.04	12.2	25.8	19.5	19.2	50	-14	29.4	10.1	8	16	14	13	84	68	79	77	1.22	0.52
A....	28.685	29.14	28.04	34.6	54.6	45.2	44.8	80	20	60.2	31.4	28	30	34	31	76	44	66	62	0.88	0.50
M...	28.534	28.90	28.18	42.5	57.4	51.3	50.4	74	24	61.2	39.8	36	36	39	37	79	49	66	65	4.98	1.04
J.....	28.418	28.82	27.90	58.7	72.9	66.8	66.1	95	36	77.9	54.8	53	56	58	56	82	58	73	71	1.10	0.52
J.....	28.601	28.84	28.27	65.3	....	79.4	72.4	102	48	87.2	59.8	60	.....	61	61	83	.....	56	69	3.11	0.76
A....	28.621	28.96	28.27	58.6	....	72.5	65.6	96	42	80.2	54.6	55	.....	58	57	88	.....	64	76	3.46	1.90
S.....	28.664	29.00	28.27	47.8	....	65.7	56.8	88	29	74.7	44.1	41	.....	43	42	78	.....	45	62	0.19	0.08
O....	28.581	28.87	28.09	34.0	....	48.6	41.3	79	17	57.8	31.3	27	.....	29	28	77	.....	52	64	0.29	0.18
N....	28.706	29.18	28.28	22.5	....	34.1	28.3	66	3	45.1	20.0	15	.....	23	19	72	.....	64	68	0.34	0.28
D....	28.642	29.10	28.11	17.3	....	25.9	21.6	63	-7	34.6	13.8	10	.....	16	13	74	.....	67	71	0.18	0.18
Y....	28.631	29.38	27.90	33.0	....	43.5	39.9	102	-36	53.6	29.3	28	.....	32	30	81	.....	67	71	17.0	....

INDIANAPOLIS, IND.

[Latitude, 39° 46′ N.; longitude, 86° 10′ W.]

J ...	29.396	30.03	28.88	19.7	26.4	23.7	23.3	60	-6	32.8	15.5	15	18	18	17	83	72	81	78	2.81	1.51
F ...	29.246	29.93	28.51	26.0	34.7	30.9	30.5	60	-2	38.6	22.6	21	24	24	23	80	65	78	74	1.45	0.76
M...	29.282	29.64	28.69	31.1	40.4	35.6	35.7	69	9	43.9	27.9	25	26	28	26	78	58	74	70	4.26	0.83
A ...	29.331	29.66	28.75	44.5	60.5	52.9	52.6	83	31	64.0	42.0	33	34	37	35	66	40	57	54	4.05	2.62
M...	29.130	29.46	28.82	53.7	67.9	59.8	60.5	86	36	70.9	50.6	46	45	47	46	75	46	65	62	4.73	2.09
J ...	29.151	29.42	28.85	66.3	80.4	71.9	72.9	96	45	82.6	62.8	58	57	60	58	76	47	67	63	2.65	1.18
J ...	29.246	29.39	29.03	71.4	....	78.9	75.2	95	58	86.3	65.2	61	.....	63	62	70	.....	60	65	3.33	2.32
A ...	29.238	29.50	28.86	67.4	....	74.8	71.1	98	49	82.9	62.7	59	.....	62	60	76	.....	66	71	5.84	1.41
S.. ..	29.258	29.54	28.94	56.4	....	65.4	60.9	88	34	74.0	52.4	48	.....	48	48	76	.....	56	66	1.23	0.57
O ...	29.192	29.53	28.79	44.9	....	52.0	48.5	78	32	58.5	42.5	39	.....	39	39	80	.....	63	72	4.03	1.74
N ...	29.322	29.72	28.79	39.3	....	45.5	42.4	76	26	50.4	37.5	34	.....	36	35	82	.....	72	77	5.07	1.88
D ...	29.302	29.65	28.84	31.7	....	36.4	34.0	56	17	41.1	29.5	25	.....	27	26	77	.....	70	73	1.91	0.64
Y ...	29.259	30.03	28.51	46.0	....	52.3	50.6	98	-6	60.5	42.6	39	.....	41	40	77	.....	67	69	41.4	....

Monthly and yearly meteorological summaries—Continued.

HATTERAS, N. C.

[*H*=11. *T*=17. *h*=2.]

Cloudiness (in tenths).				Wind.													Number of days.										Months and year.
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (in miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	
5.1	6.4	5.3	5.6	12,118	43	N.	N.	23	10	0	3	6	19	15	17	0	8	12	11	0	13	0	7	0	0	0	J.
6.0	4.8	4.2	5.0	10,140	50	W.	N.	30	12	1	8	7	16	7	5	1	9	14	6	0	11	0	4	0	0	0	F.
4.1	5.0	4.5	4.5	12,352	60	NW.	NE.	17	19	4	5	14	12	10	12	0	12	12	7	0	10	0	3	0	0	0	M.
3.3	2.2	1.7	2.4	10,441	46	N.	S.	21	21	7	3	22	8	5	3	0	19	9	2	0	6	0	0	0	1	0	A.
5.8	5.3	4.4	5.2	9,145	35	E.†	S.	12	9	6	12	39	9	4	2	0	6	16	9	0	10	0	0	0	4	0	M.
3.6	4.4	2.8	3.6	8,802	32	N.	SW.	17	19	6	1	13	28	5	1	0	13	13	4	0	8	0	0	0	5	0	J.
3.5	.....	3.3	3.4	7,989	30	N.	NE.	11	14	10	2	8	8	6	3	0	15	14	2	0	6	0	0	0	1	0	J.
3.3	.....	2.9	3.1	7,853	36	SW.	S.	5	10	3	2	18	17	6	1	0	17	11	3	0	13	0	0	0	5	0	A.
4.4	.....	3.8	4.1	9,074	52	NW.	S.	4	14	7	4	15	8	2	5	1	10	12	8	0	14	0	0	0	1	0	S.
3.2	.....	3.2	3.2	9,570	40	NW.†	N.	13	10	6	6	6	7	7	7	0	17	8	6	0	8	0	0	0	1	0	O.
5.3	.....	4.9	5.1	12,326	66	N.	NE.	9	21	2	5	9	5	4	5	0	12	6	12	0	12	0	0	0	0	0	N.
3.5	.....	2.7	3.1	10,440	50	NW.	NW.	13	12	4	1	4	9	5	14	0	18	5	8	0	6	0	4	0	0	0	D.
4.3	.....	3.6	4.0	120,253	.....	N.†	N.†	175	171	56	52	161	146	76	75	2	156	132	78	0	117	0	18	0	18	0	Y.

HELENA, MONT.

[*H*=4,069. *T*=64. *h*=51.]

Cloudiness (in tenths).				Wind.													Number of days.										Months and year.
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (in miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	
3.6	7.5	4.1	5.1	3,089	48	W.	SW.	15	9	2	0	5	22	10	14	16	7	17	7	0	8	18	27	0	0	0	J.
4.5	7.6	5.7	5.9	6,777	50	SW.	SW.	3	4	3	0	0	32	31	10	4	3	17	9	0	4	2	18	0	0	0	F.
5.3	8.4	5.3	6.3	4,672	36	NW.†	SW.	7	4	1	1	4	34	14	26	2	3	16	12	0	11	13	25	0	0	0	M.
7.2	7.2	6.9	7.1	5,941	30	SW.	SW.	2	5	4	1	2	51	18	7	0	2	15	13	0	6	0	7	0	1	0	A.
7.0	8.1	6.5	7.2	5,768	33	SW.	SW.	9	13	2	4	5	32	16	10	2	2	12	17	0	16	0	1	0	4	0	M.
7.5	7.7	7.9	7.7	5,674	40	E.	SW.	6	11	4	3	1	40	16	6	3	0	15	15	0	16	0	0	0	8	0	J.
4.2	.....	5.9	5.0	5,309	48	SW.	SW.	1	6	3	1	2	24	12	9	4	12	12	7	0	10	0	0	3	5	0	J.
3.9	.....	4.8	4.4	4,579	48	NW.	SW.	6	10	2	1	1	22	7	7	6	14	7	10	0	3	0	0	3	1	0	A.
3.3	.....	3.7	3.5	4,814	36	SW.	SW.	0	5	0	3	1	36	6	6	3	17	10	3	0	4	0	0	0	0	0	S.
6.3	.....	6.7	6.5	5,739	36	SW.	SW.	1	0	0	2	3	45	6	1	4	9	10	12	0	5	0	4	0	0	0	O.
2.6	.....	2.9	2.8	2,785	30	SW.	SW.	0	2	0	1	1	33	2	1	20	20	4	6	0	6	14	27	0	0	0	N.
2.9	.....	4.1	3.5	2,377	28	S.	SW.	3	3	0	0	1	40	1	5	9	11	10	10	0	4	9	28	0	0	0	D.
4.9	.....	5.4	5.4	57,524	.....	....	SW.	53	72	21	17	26	411	139	102	73	100	145	121	0	93	56	137	6	19	0	Y.

HURON, DAK.

[*H*=1,307. *T*=47. *h*=39.]

Cloudiness (in tenths).				Wind.													Number of days.										Months and year.
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (in miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	
4.1	4.9	3.8	4.3	8,866	60	NW.	NW.	5	2	2	21	8	10	2	34	9	10	17	4	0	7	27	31	0	0	1	J.
3.5	5.1	3.7	4.1	7,416	47	NW.	NW.	12	6	0	27	6	1	0	29	6	10	13	6	0	12	18	29	0	0	0	F.
4.5	5.9	5.1	5.2	8,498	45	NW.	NW.	4	9	6	27	1	0	2	36	8	8	15	8	0	11	17	30	0	0	1	M.
4.0	4.5	3.6	4.0	9,156	54	SW.	SE.	12	13	4	32	6	2	0	21	0	12	13	5	0	5	0	17	0	1	3	A.
6.5	6.4	5.8	6.2	8,260	36	NW.	NW.	16	21	4	13	3	3	2	29	2	4	16	11	0	14	0	5	0	1	0	M.
5.6	5.8	4.9	5.4	10,304	45	SE.	SE.	2	3	5	39	10	8	9	14	0	8	14	8	0	8	0	0	6	4	0	J.
4.4	.....	4.1	4.2	7,027	40	NE.	SE.	6	6	6	15	13	5	4	7	0	8	16	7	0	11	0	0	8	9	0	J.
3.8	.....	3.8	3.8	5,833	47	SW.	NE.	6	15	4	12	7	3	4	10	1	15	5	11	0	11	0	0	4	4	0	A.
2.9	.....	2.0	2.4	7,776	38	NW.	SE.	7	5	1	21	3	3	3	16	1	15	13	2	0	5	0	3	0	0	0	S.
3.9	.....	4.0	4.0	7,149	40	NW.	SE.	10	3	2	20	2	2	4	17	2	13	10	8	0	6	0	18	0	0	1	O.
4.0	.....	2.1	3.0	5,309	30	W.	SE.	12	2	3	24	2	2	3	8	4	21	3	6	0	4	5	28	0	1	0	N.
4.9	.....	2.8	3.8	6,837	32	NW.	NW.	12	2	0	14	9	5	2	17	1	17	7	7	0	1	13	31	0	0	0	D.
4.3	.....	3.8	4.2	92,431	.....	....	SE.	104	87	37	265	70	44	35	238	34	141	142	83	0	95	80	192	18	20	6	Y.

INDIANAPOLIS, IND.

[*H*=766. *T*=76. *h*=71.]

Cloudiness (in tenths).				Wind.													Number of days.										Months and year.
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (in miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	
5.9	7.1	6.1	6.4	4,889	24	NW.	NW.	11	4	10	9	10	10	18	21	0	4	14	13	0	10	17	28	0	0	0	J.
6.1	6.2	5.5	5.9	4,203	24	NW.	S.	8	12	8	5	17	12	11	14	0	8	7	14	0	11	8	23	0	2	0	F.
6.7	6.3	4.6	5.9	5,173	26	NW.	NW.	17	8	10	12	11	8	7	20	0	9	8	14	0	14	7	20	0	0	0	M.
4.5	4.2	3.5	4.1	4,758	24	NW.	NW.	10	8	4	18	6	14	8	21	1	11	13	6	0	9	0	3	0	2	0	A.
6.6	6.5	4.1	5.8	3,430	18	SW.	E.	5	7	18	16	9	10	13	12	3	6	15	10	0	11	0	0	0	3	0	M.
5.0	5.6	3.8	4.8	2,752	10	SW.	SW.	6	8	7	10	15	21	6	8	9	9	16	5	0	10	0	0	5	3	0	J.
3.3	.....	4.4	3.8	2,439	9	N.†	NE.	5	11	10	8	4	8	7	8	1	12	13	6	0	7	0	0	8	5	0	J.
4.5	.....	5.0	4.8	2,307	8	N.†	SW.	9	8	8	7	7	13	3	7	0	10	13	8	0	11	0	0	4	6	0	A.
3.0	....	3.2	3.1	2,536	12	W.	NE.	6	14	4	5	2	11	6	11	1	14	9	7	0	6	0	0	0	2	0	S.
6.3	.....	4.4	5.4	3,115	22	NW.†	SE.	6	4	4	13	6	7	9	11	2	10	6	15	0	14	0	0	0	2	0	O.
5.7	.....	5.2	5.4	4,071	22	NW.	NW.	6	11	6	8	8	4	4	13	0	10	1	19	0	11	0	10	0	1	0	N.
6.0	.....	5.8	5.9	5,052	26	NW.	S.	4	1	0	10	15	10	7	14	1	10	4	17	0	10	4	19	0	0	0	D.
5.3	.....	4.6	5.1	44,725	.....	....	NW.	93	96	89	121	110	128	99	160	18	113	119	134	0	124	36	103	17	26	0	Y.

Monthly and yearly meteorological summaries—Continued.

JACKSONVILLE, FLA.

[Latitude, 30° 20′ N.; longitude, 81° 39′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	7 a.m.	3 p.m.	10 p.m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°	°				In.	In.
J....	30.206	30.40	29.91	50.9	64.5	56.3	57.2	81	28	67.9	48.1	47	52	52	50	87	66	86	79	.49	0.20
F....	30.047	30.44	29.77	55.2	66.7	58.7	60.2	82	32	69.6	52.4	52	55	55	54	89	68	88	82	4.36	1.32
M....	30.090	30.45	29.73	54.0	68.3	58.6	60.3	84	35	70.6	51.2	49	50	53	51	83	54	82	73	1.57	0.80
A....	30.105	30.42	29.85	64.6	77.3	68.4	70.1	88	49	80.7	61.9	59	60	62	60	82	56	80	73	.93	0.88
M....	29.932	30.16	29.66	70.1	81.2	71.4	74.2	93	56	84.8	66.3	63	64	66	64	80	58	83	74	5.46	1.39
J....	29.957	30.25	29.77	75.6	85.7	76.2	79.2	96	64	89.5	71.6	68	68	70	68	78	57	81	72	2.92	0 78
J....	29.994	30.16	29.83	79.7	......	80.7	80.2	98	68	90.4	73.4	71	......	72	71	75	......	74	75	8.30	3.47
A....	30.032	30.15	29.91	79.6	......	79.5	79.6	96	67	91.0	74.0	71	......	73	72	75	......	82	79	4.89	1.17
S....	29.972	30.18	29.74	74.3	......	74.4	74.4	92	55	84.4	69.5	68	......	71	69	82	......	89	85	11.15	2.47
O....	30.013	30.22	29.59	65.9	......	69.1	67.5	86	50	76.9	60.9	60	......	64	62	82	......	84	83	6.00	2.42
N....	30.062	30.28	29.81	58.1	......	60.9	59.5	83	38	68.8	54.3	53	......	57	55	84	......	87	86	4.16	1.02
D....	30.135	30.42	29.61	49.0	......	53.6	51.3	74	28	62.6	44.6	42	......	50	46	77	......	89	83	2.88	2.03
Y....	30.045	30.45	29.59	64.8	......	67.3	67.8	98	28	78.3	60.7	59	......	62	60	81	......	84	78	53.1	......

JUPITER, FLA.

[Latitude, 26° 57′ N.; longitude, 80° 7′ W.]

J....	30.191	30.32	30.00	64.5	72.9	67.8	68.4	83	45	75.7	61.8	59	60	60	60	84	65	76	75	1.50	0.79
F ...	30.071	30.35	29.83	64.3	73.8	67.1	68.4	85	47	76.2	61.6	60	62	62	61	85	67	83	78	3.27	1.16
M ...	30.101	30.33	29.81	64.0	72.8	67.4	68.1	83	45	75.2	61.7	57	59	60	59	80	64	77	73	1.25	0.64
A....	30.115	30.34	29.90	69.0	77.3	72.5	72.9	88	59	80.0	66.0	65	67	66	66	88	71	80	80	4.08	2.32
M ...	29.963	30.14	29.73	74.4	79.8	74.7	76.3	88	62	82.0	70.1	70	72	71	71	88	78	88	85	8.86	3.18
J....	29.996	30.19	29.86	77.8	82.5	77.9	79.4	89	68	85.2	73.1	74	74	73	74	88	78	86	84	5.52	2.10
J....	30.022	30.14	29.93	81.8	......	80.3	81.0	94	69	88.1	74.8	76	......	75	76	83	......	85	84	3.72	0.84
A....	30.036	30.13	29.92	83.0	......	82.0	82.5	90	72	88.0	75.8	76	......	76	76	81	......	82	82	4.44	2.96
S....	29.938	30.08	29.57	79.7	......	79.8	79.8	89	67	85.2	73.7	74	......	75	75	84	......	85	85	8.72	3.46
O ...	29.998	30.16	29.69	76.0	......	77.0	76.5	86	61	82.4	71.1	69	......	70	70	80	......	80	80	3.78	1.60
N. .	30.015	30.17	29.88	69.9	......	70.9	70.4	83	43	76.8	65.0	64	......	65	65	83	......	83	83	3.98	1.06
D....	30.104	30.30	29.69	60.9	......	64.8	62.8	78	36	70.3	56.4	56	......	58	57	83	......	80	81	3.26	0.84
Y....	30.046	30.35	29.57	72.1	......	73.5	73.9	94	36	80.4	67.6	67	......	68	67	84	......	82	81	52.4	......

KANSAS CITY, MO.

[Latitude, 39° 5′ N.; longitude, 94° 37′ W.]

J....	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
F....	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
M ...	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
A ...	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
M ...	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
J....	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
J....	29.040	29.24	28.86	73.7	......	81.0	78.8	97	64	89.6	70.7	68	......	68	68	81	......	61	71	4.53	1.29
A ...	29.041	29.30	28.78	67.7	......	76.6	72.2	97	56	82.0	65.5	63	......	67	65	85	......	74	79	9.18	3.03
S....	29.103	29.44	28.92	58.9	......	70.4	64.6	92	41	78.3	56.2	52	......	56	54	80	......	62	71	0.26	0.25
O ...	29.024	29.28	28.70	47.2	......	57.4	52.3	85	35	64.2	45.1	40	......	42	41	77	......	58	68	4.49	2.98
N ...	29.148	29.56	28.72	37.0	......	43.9	40.4	78	26	49.0	35.0	31	......	34	32	80	......	69	75	2.98	0.96
D ...	29.114	29.49	28.54	31.4	......	38.1	34.8	60	14	42.9	28.9	25	......	28	26	77	......	70	74	0.79	0.41
Y ...	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......

KEELER, CAL.

[Latitude, 36° 35′ N.; longitude, 117° 50′ W.]

J.....	26.369	26.87	25.75	30.8	38.1	36.9	35.3	58	12	43.7	27.0	20	23	22	22	66	57	57	60	0.70	0.52
F ...	26.339	26.52	25.90	42.2	50.7	50.4	47.8	69	30	57.9	39.4	30	30	28	29	64	49	44	52	1.21	0.88
M...	26.262	26.72	25.91	43.7	54.3	53.7	50.6	72	27	61.7	39.8	25	25	25	25	49	34	37	40	0.30	0.23
A ...	26.316	26.52	26.01	55.4	67.7	67.2	63.4	86	39	75.1	51.3	33	34	30	32	44	29	28	34	0.12	0.10
M...	26.187	26.37	25.97	57.5	71.7	70.1	66.4	88	41	77.1	53.7	34	35	38	36	42	27	32	34	0.30	0.09
J.....	26.160	26.32	25.93	64.2	79.3	78.3	73.9	96	48	86.2	60.6	35	34	32	34	36	21	22	26	0.20	0.20
J.....	26.286	26.51	26.16	70.4	......	88.2	79.3	98	51	92.5	67.8	40	......	41	42	36	......	23	29	0.17	0.11
A ..	26.273	26.43	26.06	70.5	......	90.5	80.5	100	60	93.7	67.7	38	......	42	40	32	......	20	26	0.10	0.10
S ...	26.294	26.48	26.08	70.4	......	86.0	78.2	96	59	89.9	66.7	44	......	44	44	40	......	24	32	0.06	0.05
O ...	26.284	26.48	26.03	57.2	......	71.6	64.4	85	47	76.5	53.9	33	......	34	33	41	......	27	34	0.00	0.00
N ...	26.324	26.53	26.03	44.9	......	53.9	49.4	70	32	58.1	41.6	29	......	31	30	57	......	47	52	1.68	0.70
D ...	26.382	26.63	25.94	39.2	......	46.5	42.8	56	30	50.2	35.3	31	......	32	31	72	......	58	65	0.82	0.71
Y ...	26.290	26.87	25.75	53.9	......	66.1	61.0	100	12	71.9	50.4	33	......	33	33	48	......	35	40	5.66	......

Monthly and yearly meteorological summaries—Continued.

JACKSONVILLE, FLA.

[*H*=43. *T*=69. *h*=56.]

Cloudiness (in tenths).				Wind.													Number of days.										
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
4.8	5.3	3.7	4.6	4,293	26	NW.	NE.†	12	18	1	6	17	7	11	9	12	11	13	7	0	11	0	2	0	0	0	J.
6.3	6.6	3.5	5.5	4,618	33	SW.	SW.†	14	14	2	7	17	17	6	8	2	7	13	9	0	13	0	0	0	2	0	F.
5.2	4.7	3.0	4.3	5,715	29	S.	S.†	4	19	4	11	19	13	8	8	7	12	11	8	0	6	0	0	0	0	0	M.
3.7	4.6	2.2	3.5	5,148	26	NE.†	NE.	8	25	5	8	17	15	4	4	4	14	15	1	0	5	0	0	0	2	0	A.
3.7	5.3	3.1	4.0	4,682	29	W.	SE.	4	3	4	25	21	8	10	5	13	11	17	3	0	15	0	0	2	10	0	M.
3.4	4.9	3.1	3.8	4,331	30	SW.	S.	0	16	7	10	26	16	4	4	7	10	17	3	0	16	0	0	16	11	0	J.
3.0	.....	4.3	3.6	3,961	22	SW.	NE.	1	16	7	8	4	11	3	3	9	11	18	2	0	13	0	0	18	5	0	J.
3.3	.....	4.4	3.8	4,308	31	SE.	S.	1	11	7	12	14	8	0	3	6	7	18	6	0	13	0	0	18	8	0	A.
5.7	.....	5.6	5.6	4,355	42	S.	NE.	8	15	8	3	9	5	1	1	10	5	9	16	0	18	0	0	4	3	0	S.
4.4	.....	2.4	3.4	3,957	38	N.	NE.	10	13	3	10	3	6	2	8	7	14	13	4	0	10	0	0	0	2	0	O.
6.3	.....	5.0	5.6	4,915	26	SE.	N.	19	13	3	4	2	5	9	5	0	11	5	14	0	17	0	0	0	0	0	N.
5.2	.....	4.8	5.0	4,220	35	W.	NE.	14	16	2	1	2	0	8	13	6	13	9	9	0	10	0	1	0	0	0	D.
4.6	5.2	3.8	4.4	54,503	.....	....	NE.	95	179	53	105	151	111	66	71	83	126	158	82	0	147	0	3	58	43	0	Y.

JUPITER, FLA.

[*H*—28. *T*—13. *h*—1.]

Cloudiness (in tenths).				Wind.													Number of days.										
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
4.8	3.8	3.0	3.8	6,627	30	NE.†	SE.	11	6	21	25	10	1	9	9	1	9	22	0	0	6	0	0	0	0	0	J.
5.0	5.7	4.1	4.9	6,660	32	NE.	S.	12	8	8	7	25	12	4	11	0	4	21	4	0	11	0	0	0	0	0	F.
4.3	5.5	3.5	4.4	8,745	29	N.	S.†	15	8	15	16	16	6	9	7	1	9	19	3	0	5	0	0	0	1	0	M.
3.3	3.7	3.8	3.6	7,212	36	NE.	SE.	8	17	15	22	9	5	8	4	2	14	12	4	0	6	0	0	0	0	0	A.
4.3	4.9	3.9	4.4	7,272	25	SE.†	SE.	4	4	1	46	18	9	5	3	3	15	10	6	0	12	0	0	0	2	0	M.
3.2	4.6	3.1	3.6	5,092	25	SE.	SE.	3	8	7	39	13	6	7	3	4	13	13	4	0	6	0	0	0	0	0	J.
2.9	.....	3.9	3.4	4,161	24	S.	SE.	3	3	9	17	10	12	5	1	2	20	6	5	0	13	0	0	3	2	0	J.
3.4	.....	3.0	3.2	5,916	60	E.	SE.	0	3	9	37	9	3	0	0	1	20	4	7	0	9	0	0	3	0	0	A.
5.7	.....	5.5	5.6	6,209	35	S.†	SE.	5	14	4	26	6	0	0	3	2	10	10	10	0	13	0	0	0	1	0	S.
3.7	.....	3.6	3.6	6,422	26	S.†	SE.	2	15	8	19	3	3	5	7	0	17	9	5	0	6	0	0	0	0	0	O.
4.7	.....	4.8	4.8	7,623	24	NE.†	NW.	2	15	6	6	3	3	7	17	1	13	10	7	0	12	0	0	0	0	0	N.
5.3	.....	4.5	4.9	7,563	28	SE.	NW.	1	8	8	9	0	3	3	30	0	13	10	8	0	11	0	0	0	0	0	D.
4.2	.....	3.9	4.2	79,502	.....	....	SE.	66	109	111	269	122	63	62	95	17	157	146	63	0	110	0	0	6	6	0	Y.

KANSAS CITY, MO.

[*H*=947. *T*=86. *h*=77.]

Cloudiness (in tenths).				Wind.													Number of days.										
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	J.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	..	F.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	M.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	A.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	M.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	J.
4.9	.....	3.1	4.0	4,955	42	S.	S.	4	9	3	14	17	9	1	3	2	12	15	4	0	7	0	0	12	2	0	J.
6.2	.....	5.1	5.6	4,719	40	SE.	SE.	7	8	6	21	6	4	0	5	5	8	12	11	0	13	0	0	3	9	0	A.
3.5	.....	2.9	3.2	3,833	21	SW.†	NW.	5	10	7	8	4	7	2	13	4	15	14	1	0	3	0	0	2	1	0	S.
5.0	.....	3.3	4.2	6,207	30	SW.	NW.	2	3	4	11	11	10	3	18	0	17	3	11	0	5	0	0	0	1	0	O.
5.3	.....	4.0	4.6	5,253	34	S.	NW.†	7	8	4	12	6	6	2	12	3	13	5	12	0	7	2	14	0	2	0	N.
5.1	.....	4.0	4.6	6,488	34	S.	N.	15	2	1	8	8	10	2	14	2	15	4	12	0	5	6	23	0	0	0	D.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	Y.

KEELER, CAL.

[*H*=3,622. *T*=20. *h*=20.]

Cloudiness (in tenths).				Wind.													Number of days.										
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
2.7	3.9	3.8	3.4	4,055	40	NW.	E.	4	7	14	12	9	10	11	7	19	18	10	3	0	2	1	20	0	0	0	J.
2.5	3.9	2.0	2.8	4,772	40	NW.	N.	17	6	10	8	10	11	6	12	7	17	9	3	0	4	0	1	0	1	0	F.
2.9	3.5	2.5	3.0	6,211	42	S.	S.	11	5	6	9	18	11	8	14	11	17	13	1	0	4	0	2	0	0	0	M
1.7	4.0	2.9	2.9	4,501	42	NW.	S.	6	10	13	11	16	9	11	8	6	15	15	0	0	2	0	0	0	1	0	A.
1.1	4.5	3.7	3.1	5,282	35	NW.†	S.†	16	10	9	11	16	11	9	5	6	16	14	1	0	5	0	0	0	2	0	M
0.8	2.2	1.5	1.5	5,671	42	NW.	SE.	8	3	12	18	17	11	9	8	4	22	7	1	0	2	0	0	7	1	0	J.
1.5	.....	2.6	2.0	5,049	42	S.	E.	8	1	11	4	10	8	8	5	7	21	6	4	0	2	0	0	24	1	0	J.
0.4	.....	1.7	1.0	4,048	39	S.	S.	3	6	10	7	15	6	1	9	5	27	3	1	0	2	0	0	23	2	0	A.
1.5	.....	3.1	2.3	4,299	34	S.†	S.†	4	0	9	12	12	3	7	5	8	18	10	2	0	2	0	0	15	3	0	S.
0.6	.....	1.9	1.2	4,256	36	NW.	N.	12	2	10	9	8	2	0	8	11	26	3	2	0	0	0	0	0	0	0	O.
2.8	.....	3.4	3.1	3,752	34	NW.	S.†	8	6	9	11	11	2	2	5	6	15	10	5	0	7	0	0	0	0	0	N.
2.7	.....	3.3	3.0	2,649	31	SE.	E.	11	5	13	12	4	1	2	1	13	15	11	5	0	3	0	4	0	0	0	D.
1.8	.....	2.7	2.4	54,545	...	....	S.	108	61	126	124	146	85	74	87	103	227	111	28	0	35	1	27	69	11	0	Y.

Monthly and yearly meteorological summaries—**Continued.**

KEOKUK, IOWA.

[Latitude, 40° 22′ N.; longitude, 91° 26′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	Maximum.	Minimum.	Mean. Maximum.	Mean. Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	7 a.m.	8 p.m.	10 p.m.	Mean.	Total.	Max. 24 hours.
	In.	*In.*	*In.*	°	°	°	°	°	°	°	°	°	°	°	°					*In.*	*In.*
J....	29.551	30.21	28.95	9.0	17.5	14.2	13.6	53	-23	24.3	5.0	3	9	8	7	78	69	77	75	1.57	0.90
F....	29.314	30.14	28.76	20.8	30.1	26.2	25.7	61	-12	35.3	17.2	16	22	21	20	83	72	80	78	2.17	1.28
M...	29.396	29.87	28.76	28.5	39.7	34.5	34.2	70	5	44.6	25.6	23	25	26	25	80	59	74	71	3.45	1.47
A....	29.431	29.88	28.93	44.9	61.3	53.4	53.2	81	29	64.7	42.5	37	37	39	38	76	42	60	59	1.85	0.90
M...	29.246	29.56	28.81	51.3	64.7	58.0	58.0	83	36	67.9	48.8	45	48	50	48	81	57	75	71	5.06	1.65
J....	29.267	29.53	29.01	64.8	76.0	70.2	70.3	88	46	79.3	62.4	60	60	62	60	83	59	77	73	5.42	1.86
J....	29.358	29.54	29.18	72.0	....	79.4	75.7	96	61	86.2	68.0	66	.....	70	68	83	.....	74	78	6.00	1.36
A....	29.374	29.65	29.14	66.4	....	75.1	70.8	95	51	80.8	63.4	61	.....	64	62	82	.....	68	75	2.07	0.98
S....	29.412	29.76	29.16	54.4	....	65.5	60.0	87	35	73.3	52.3	49	.....	52	50	82	.....	63	72	2.18	1.09
O....	29.329	29.61	28.98	43.8	....	53.5	48.6	78	32	60.8	41.9	38	.....	39	38	79	.....	61	70	1.63	0.89
N...	29.478	29.92	28.92	36.1	....	42.3	39.2	79	22	49.8	33.8	31	.....	33	32	82	.....	70	76	2.83	1.20
D...	29.434	29.76	28.83	30.1	....	34.4	32.2	61	14	40.6	27.4	25	.....	26	26	82	.....	74	78	1.61	1.20
Y...	29.382	30.21	28.76	43.5	....	50.6	48.5	96	-23	59.0	40.7	38	.....	41	40	81	.....	71	73	35.80	....

KEY WEST, FLA.

[Latitude, 24° 34′ N.; longitude, 81° 49′ W,]

J.....	30.186	30.30	30.03	70.0	73.9	71.4	71.8	81	58	75.9	67.8	65	63	66	65	84	70	82	79	0.37	0.17
F....	30.082	30.32	29.89	71.2	74.1	71.9	72.4	80	59	76.3	68.2	66	64	65	65	84	72	80	79	0.51	0.16
M ...	30.105	30.29	29.91	69.8	73.3	70.9	71.3	82	58	75.6	67.0	64	62	65	64	83	70	82	78	0.91	0.62
A....	30.115	30.29	30.00	74.4	78.0	74.7	75.7	82	64	79.7	70.8	67	65	68	67	79	64	80	74	1.15	0.80
M ...	29.974	30.09	29.76	77.8	80.1	77.6	78.5	85	66	82.1	73.6	71	70	71	71	81	72	82	78	2.65	1.45
J.....	30.010	30.14	29.89	81.2	83.5	81.0	81.9	89	73	85.7	77.7	74	72	74	73	80	70	79	76	0.88	0.35
J.....	30.034	30.15	29.94	84.1	....	82.5	83.3	90	68	87.8	76.4	76	.....	75	75	76	.....	79	78	9.04	1.72
A....	30.020	30.10	29.91	84.1	....	83.9	84.0	91	71	88.2	78.7	76	.....	75	76	76	.....	76	76	2.00	0.74
S.....	29.932	30.06	29.64	82.4	....	82.3	82.4	89	71	85.6	77.1	75	.....	75	75	79	.....	79	79	5.45	2.42
O ...	29.998	30.15	29.73	78.9	....	79.3	79.1	85	66	82.4	74.5	73	.....	73	73	82	.....	80	81	3.42	1.12
N ...	30.022	30.12	29.91	74.4	....	75.0	74.7	84	58	77.8	70.0	70	.....	69	70	86	.....	83	84	4.74	2.24
D ...	30.113	30.32	29.83	66.6	....	67.6	67.1	79	52	71.1	62.6	62	.....	62	62	85	.....	82	83	4.46	2.56
Y ...	30.019	30.32	29.64	76.2	....	76.5	76.8	91	52	80.7	72.0	70	.....	70	70	81	.....	80	79	35.6	....

KNOXVILLE, TENN.

[Latitude 35° 56′ N.; longitude 83° 58′ W.]

J	29.206	29.53	28.70	35.6	44.7	39.8	40.0	70	12	48.1	33.0	30	33	32	32	80	67	75	74	6.61	1.38
F....	29.055	29.53	28.56	38.9	51.3	45.6	45.3	67	9	54.4	37.4	33	36	37	35	81	59	73	71	3.75	0.86
M ...	29.091	29.42	28.54	39.6	53.4	47.6	46.9	76	19	57.4	37.2	32	36	36	34	75	54	66	65	4.22	1.18
A ...	29.129	29.52	28.80	52.0	70.6	61.4	61.3	85	35	73.4	49.5	44	47	46	46	74	44	59	59	4.00	2.39
M ...	28.951	29.19	28.77	59.3	72.0	64.3	65.2	87	36	75.4	56.6	56	59	58	58	88	65	80	78	6.30	2.05
J.....	28.986	29.29	28.73	67.2	80.3	72.4	73.3	95	50	83.9	64.0	64	64	65	64	88	59	79	75	4.18	1.72
J.....	29.050	29.19	28.92	72.0	....	79.2	75.6	93	60	87.4	67.2	67	......	68	67	84	.....	69	77	3.45	0.94
A	29.054	29.23	28.62	71.5	....	77.1	74.3	96	53	86.3	67.2	66	......	67	67	84	......	72	78	2.77	0.86
S......	29.053	29.30	28.84	61.2	....	67.3	64.2	85	35	75.3	58.5	58	.....	60	59	91	.....	77	84	6.55	2.59
O....	29.034	29.31	28.69	48.5	....	55.8	52.1	78	36	63.7	45.7	44	.....	46	45	86	.....	70	78	6.11	1.35
N ...	29.126	29.40	28.74	44.2	....	51.3	47.8	77	26	57.4	42.5	39	.....	41	40	82	.....	70	76	3.19	1.40
D....	29,150	29.48	28.60	33.4	....	41.0	37.2	60	22	47.6	31.3	28	......	31	30	82	......	68	75	1.90	0.54
Y....	29.074	29.53	28.54	52.0	....	58.6	56.9	96	9	67.5	49.2	47	.....	49	48	83	.....	72	74	53.0	....

LA CROSSE, WIS.

[Latitude, 43° 49′ N.; longitude 91° 15′ W.]

J.....	29.444	30.06	28.56	-1.7	6.5	3.0	2.6	34	-42	12.0	-7.4	-4	0	0	-1	91	76	89	85	1.44	0.87
F ...	29.252	30.07	28.70	9.8	20.5	16.6	15.6	48	-28	25.7	5.9	7	12	11	10	90	70	80	80	0.61	0.45
M...	29.325	29.84	28.70	17.5	25.8	23.3	22.2	49	-10	30.1	14.1	13	15	15	14	84	65	71	73	4.12	1.36
A ...	29.342	29.78	28.84	38.2	50.0	44.1	44.1	74	26	53.0	35.7	30	30	30	30	74	49	62	62	3.29	0.62
M..	29.127	29.51	28.70	47.1	55.8	52.1	51.7	79	32	58.9	45.3	41	39	42	40	80	56	70	68	6.20	1.76
J.....	29.127	29.41	28.84	61.5	73.9	68.3	67.9	90	44	77.0	59.1	55	58	58	57	81	58	71	70	3.62	0.90
J.....	29.244	29.45	28.99	68.0	....	76.1	72.0	91	57	83.0	64.4	62	.....	63	63	82	.....	67	74	4.55	1.85
A ...	29.247	29.57	28.97	61.7	....	70.4	66.0	91	50	76.5	59.2	57	.....	59	58	86	.....	69	77	5.93	2.22
S.. ..	29.292	29.64	28.79	50.4	....	60.8	55.6	82	29	67.8	47.9	45	.....	48	47	82	.....	66	74	1.66	0.88
O ...	29.193	29.55	28.81	40.5	....	48.8	44.6	73	26	54.8	38.3	35	.....	36	35	82	.....	63	72	1.12	0.44
N ...	29.358	29.87	28.88	32.0	....	39.0	35.5	69	9	45.3	29.2	27	.....	29	28	82	.....	68	75	0.28	0.13
D ...	29.266	29.60	28.76	24.9	....	29.7	27.3	56	2	35.2	20.7	20	.....	22	21	83	.....	74	78	2.03	0.89
Y ...	29.268	30.07	28.56	37.5	....	44.4	42.1	91	-42	51.6	34.4	32	.....	34	34	83	.....	71	74	34.8	....

Monthly and yearly meteorological summaries—**Continued.**

KEOKUK, IOWA.

[*H*=618. *T*=69. *h*=60.]

Cloudiness (in tenths).				Wind.													Number of days.										Months and year.
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	
3.7	4.1	3.6	3.8	5,619	36	W.	NW.	16	5	7	11	3	5	15	20	11	13	15	3	1	7	21	30	0	0	0	J.
2.8	4.5	4.2	3.9	6,630	30	S.†	NW.	12	6	11	12	13	9	3	20	1	15	8	6	1	9	9	24	0	0	0	F.
5.9	4.2	3.8	4.6	8,317	36	NW.†	NW.	12	12	16	8	11	7	8	18	1	10	13	8	0	11	5	23	0	1	0	M.
3.7	4.1	2.2	3.3	7,450	34	SW.†	SE.	16	8	9	18	12	7	3	13	4	16	12	2	0	6	0	2	0	1	1	A.
4.3	5.6	4.1	4.7	6,555	48	SE.	E.	17	6	18	14	7	9	8	10	4	13	11	7	0	13	0	0	0	6	0	M.
5.1	5.4	4.0	4.8	5,586	36	W.†	S.	8	4	10	15	25	6	8	6	8	7	19	4	0	12	0	0	0	7	0	J.
3.6	.....	3.7	3.6	4,794	36	NW.	S.	3	5	11	4	12	10	5	10	2	11	14	6	0	13	0	0	7	9	0	J.
4.8	.....	3.4	4.1	4,919	36	N.	NE.	8	10	9	5	9	9	3	5	4	9	14	8	0	8	0	0	3	8	0	A.
2.6	.....	3.6	3.1	4,579	24	NW †	NW.	7	9	10	4	3	5	6	12	4	13	12	5	0	6	0	0	0	2	0	S.
4.6	.....	3.3	4.0	6,093	35	SW.	NW.	7	7	5	8	9	5	6	15	0	13	11	7	0	9	0	0	0	3	0	O.
5.2	...	4.7	5.0	5,246	36	S.	NW.†	10	10	7	4	9	3	2	10	5	13	6	11	0	10	0	14	0	1	0	N.
5.2	.....	4.8	5.0	6,812	30	S.	NW.	6	3	2	3	11	9	6	14	8	10	8	13	0	6	6	22	0	0	0	D.
4.3	.....	3.8	4.2	72,600	.....	....	NW.	122	85	115	106	124	84	73	153	52	143	143	80	2	110	41	115	10	38	1	Y.

KEY WEST, FLA.,

[*H*=22. *T*=43. *h*=46.]

5.8	4.9	3.5	4.8	8,482	33	NW.	E.	9	16	53	4	5	1	0	5	0	5	23	3	0	7	0	0	0	0	0	J.
5.5	4.7	3.9	4.7	7,375	32	NW.	SE.	9	17	11	20	12	12	2	3	1	4	22	3	0	5	0	0	0	0	0	F.
4.9	6.0	3.9	4.9	8,518	36	N.	E.	16	5	34	14	4	5	2	2	11	8	18	5	0	5	0	0	0	0	0	M.
4.7	4.6	3.5	4.3	6,938	38	NE.	E.	12	14	37	19	1	0	2	1	4	12	13	5	0	8	0	0	0	0	0	A.
5.3	5.1	4.8	5.0	6,501	36	NW.†	SE.	10	2	15	32	10	7	4	7	6	5	20	6	0	7	0	0	0	3	0	M.
6.7	6.6	5.0	6.1	5,406	24	W.†	E.	2	3	28	18	9	8	6	3	13	3	20	7	0	9	0	0	0	2	0	J.
5.4	.....	6.7	6.0	4,031	30	W.	E.	0	1	14	12	7	6	3	10	9	6	15	10	0	17	0	0	1	7	0	J.
6.5	.....	4.7	5.6	5,513	32	E.	SE.	2	1	17	32	3	0	0	1	6	5	20	6	0	13	0	0	2	2	0	A.
7.2	.....	4.5	5.8	6,280	54	NE.	SE.	9	6	11	19	6	2	2	1	4	2	20	8	0	13	0	0	0	1	0	S.
5.6	.....	3.7	4.6	6,981	36	SW.	E.	3	12	21	14	4	0	2	4	2	14	7	10	0	12	0	0	0	1	0	O.
6.1	.....	4.0	5.0	7,617	32	NE.	E.	16	13	21	2	3	0	1	1	3	9	12	9	0	15	0	0	0	2	0	N.
6.1	....	3.5	4.8	8,656	48	E.	N.	21	12	15	2	1	0	1	7	3	9	12	10	0	9	0	0	0	1	0	D.
5.8	.....	4.3	5.1	82,298	.....	....	E.	109	102	277	188	65	41	25	45	62	82	202	82	0	120	0	0	3	19	0	Y.

KNOXVILLE, TENN.

[*H*=980. *T*=79. *h*=71]

6.5	7.2	5.0	6.2	4,867	28	SW.	W.	16	14	11	3	0	16	23	9	1	3	16	12	0	17	0	15	0	0	0	J.
7.2	6.7	6.1	6.6	4,410	36	SW.	W.	17	8	13	1	3	10	22	7	6	6	9	14	0	13	0	6	0	1	0	F.
5.9	5.7	4.9	5.5	4,846	38	S.	N.	22	6	10	4	4	14	9	9	15	9	9	13	0	10	0	12	0	2	0	M.
3.1	3.4	1.9	2.8	4,885	36	W.	N.	17	12	7	3	5	15	14	9	8	19	7	4	0	9	0	0	0	4	0	A.
6.2	6.1	5.7	6.0	4,373	26	W.	SW.	9	15	14	6	10	16	13	6	4	6	12	13	0	16	0	0	0	4	0	M.
4.2	4.7	2.9	3.9	3,350	32	SW.	SW.	13	10	12	2	2	14	16	7	4	12	14	4	0	11	0	0	4	7	0	J.
3.3	.....	3.6	3.4	3,149	36	N.	E.	11	8	14	7	0	10	9	2	1	14	14	3	0	9	0	0	6	6	0	J.
2.9	.....	4.6	4.2	3,396	48	SW.	SW.	4	10	10	8	0	16	7	2	5	14	7	10	0	15	0	0	8	6	0	A.
4.4	.....	4.3	4.4	3,181	18	E.	E.	8	10	16	2	2	7	10	3	2	12	7	11	0	13	0	0	0	1	0	S.
4.8	.....	4.3	4.6	4,060	30	SW.	W.†	9	9	9	3	1	13	13	5	0	13	8	10	0	16	0	0	0	0	0	O.
6.1	.....	5.5	5.8	3,992	23	SW.	NE.	9	25	8	1	0	6	8	1	2	6	9	15	0	7	0	6	0	0	0	N.
4.1	.....	4.0	4.0	3,636	28	S.	NE.	7	16	9	1	1	3	14	6	5	15	5	11	0	8	0	18	0	0	0	D.
5.0	.....	4.4	4.8	48,075	.....	....	W.†	142	143	133	41	28	150	158	66	53	129	117	120	0	144	0	57	18	31	0	Y.

LA CROSSE, WIS.

[*H*=744. *T*=79. *h*=71.]

5.7	4.7	4.2	4.8	4,738	27	S.	S.	10	7	2	3	28	6	7	26	4	7	18	6	0	12	29	31	0	0	1	J.
5.6	7.1	4.7	5.8	5,310	29	† NW.	S.	10	3	4	9	27	7	5	20	2	5	14	10	0	7	15	28	0	0	0	F.
6.7	6.5	5.9	6.4	6,005	32	W.	NW.	10	9	9	9	13	3	10	27	3	4	15	12	0	9	16	31	0	0	1	M.
5.7	6.9	5.8	6.2	6,714	28	†NW.	NW.	11	10	2	12	19	7	6	23	0	4	15	11	0	13	0	8	0	4	2	A.
7.1	8.0	7.9	7.7	5,541	25	SW.	S.	6	15	7	3	24	6	11	18	3	4	9	18	0	16	0	0	0	3	1	M.
5.5	5.8	5.1	5.5	5,980	36	SE.	S.	3	9	0	13	41	5	7	9	3	8	14	8	0	11	0	0	1	6	0	J.
5.7	.....	3.6	4.6	4,468	35	W.	S.	8	4	6	13	17	5	4	4	1	7	18	6	0	10	0	0	1	10	0	J.
5.0	.....	3.3	4.2	4,354	36	W.	S.	11	3	4	6	18	7	2	10	1	12	13	6	0	11	0	0	1	8	0	A.
3.6	.....	4.2	3.9	5,236	32	S.	SW.	11	2	3	4	12	13	6	8	1	15	7	8	0	9	0	1	0	2	0	S.
5.6	.....	4.5	5.0	5,604	30	†S.	S.	9	2	0	5	21	4	4	12	5	10	10	11	0	9	0	5	0	2	0	O.
6.1	.....	3.9	5.0	5,318	30	NW.	S.	11	1	0	4	25	5	3	11	0	13	7	10	0	4	1	17	0	1	0	N.
6.8	.....	4.7	5.8	6,981	36	NW.	S.	10	2	0	1	28	1	6	14	0	10	10	11	0	9	14	27	0	0	0	D.
5.8	.....	4.8	5.4	66,249	.....	....	S.	110	67	37	82	273	69	71	182	23	99	150	117	0	120	75	148	3	36	5	Y.

Monthly and yearly meteorological summaries—Continued.

LAMAR, MO.

[Latitude, 37° 32′ N.; longitude, 94° 15′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ...	29.174	29.74	28.57	19.8	30.5	25.5	25.3	67	-12	34.8	16.2	15	20	20	19	84	69	80	77	2.18	1.32
F ...	29.008	29.61	28.53	30.9	42.6	36.6	36.7	69	7	46.7	27.0	27	32	30	30	84	68	78	77	1.94	0.93
M ...	29.013	29.54	28.41	35.0	48.5	42.2	41.9	84	14	53.8	31.7	28	34	35	32	78	61	76	72	2.36	0.53
A ...	29.052	29.47	28.60	50.7	67.2	58.1	58.7	83	31	70.3	48.5	44	46	46	45	78	50	65	64	3.27	2.09
M ...	28.857	29.15	28.57	55.0	70.2	62.2	62.5	84	37	74.2	51.9	50	54	53	52	83	59	72	71	5.63	2.54
J ...	28.882	29.14	28.63	65.8	78.9	70.7	71.8	90	47	81.8	62.8	62	66	65	64	88	67	82	79	5.08	1.66
J ...	28.987	29.17	28.84	74.0	....	82.4	78.2	98	60	90.0	68.4	69	.....	71	70	85	.....	69	77	1.17	0.62
A ...	28.962	29.20	28.70	69.1	....	77.0	73.0	98	55	83.6	66.2	65	.....	68	66	86	.....	76	81	8.75	2.96
S ...	29.030	29.34	28.87	59.3	....	68.6	64.0	89	38	78.5	54.9	54	.....	58	56	85	.....	69	78	0.67	0.42
O ...	28.970	29.26	28.67	47.1	....	55.6	51.4	83	32	66.5	43.4	42	.....	45	43	82	.....	71	76	3.63	1.10
N ...	29.082	29.44	28.62	39.1	....	43.3	41.2	81	26	51.3	34.7	33	.....	34	34	82	.....	72	77	2.50	1.50
D ...	29.072	29.42	28.54	32.4	....	38.1	35.2	63	17	46.8	29.3	26	.....	31	29	80	.....	76	78	5.73	2.42
Y ...	29.007	29.74	28.41	48.2	....	55.0	53.3	98	-12	64.9	44.6	43	.....	46	45	83	.....	74	76	42.9	....

LANSING, MICH.

[Latitude, 42° 44′ N.; longitude, 84° 32′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Mean maximum.	Mean minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
J	29.217	29.85	28.53	13.1	18.9	15.1	15.7	39	-9	23.1	'8.5	9	13	11	11	82	77	84	81	2.43	0.88
F	29.066	29.84	28.21	18.8	26.8	22.5	22.7	46	-12	31.4	13.1	14	18	17	16	82	72	80	78	1.92	0.84
M ...	29.131	29.50	28.47	21.5	32.3	26.0	26.6	70	2	36.2	17.7	17	23	21	20	84	71	81	79	2.01	0.57
A ...	29.178	29.53	28.58	36.8	50.5	41.6	43.0	82	22	53.8	33.0	30	33	34	32	78	54	76	69	1.45	0.49
M ...	28.996	29.39	28.56	47.3	60.2	51.7	53.1	82	29	63.8	43.0	43	45	47	45	85	60	85	77	3.95	1.09
J	29.009	29.31	28.76	61.8	76.8	65.5	68.0	96	40	79.6	55.3	57	58	60	58	84	54	84	74	2.43	0.75
J	29.107	29.28	28.86	66.6	....	73.2	69.9	92	48	83.2	58.1	60	.....	62	60	78	.....	68	73	2.00	1.12
A ...	29.092	29.37	28.85	62.8	....	68.5	65.6	90	39	79.2	55.2	57	.....	60	59	83	.....	76	79	1.68	0.63
S	29.120	29.46	28.66	51.5	....	57.8	54.6	87	33	70.1	44.7	48	.....	51	49	89	.....	79	84	1.91	1.00
O	29.016	29.40	28.47	41.5	....	45.5	43.5	73	25	53.4	37.1	39	.....	42	40	90	.....	89	90	2.97	1.21
N ...	29.174	29.67	28.65	34.1	....	38.2	36.2	72	15	45.3	30.9	31	.....	35	33	90	.....	90	90	3.01	1.64
D ...	29.089	29.48	28.55	27.7	....	30.4	29.0	51	10	35.7	23.7	26	.....	28	27	93	.....	94	93	1.31	0.70
Y ...	29.100	29.85	28.21	40.3	....	44.7	44.0	96	-12	54.6	35.0	36	.....	39	38	85	.....	82	81	27.1	....

LEAVENWORTH, KANS.

[Latitude, 39° 19′ N.; longitude, 94° 57′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Mean maximum.	Mean minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
J	29.369	29.99	28.68	10.5	22.4	16.0	16.3	55	-21	26.0	7.6	4	13	10	9	76	68	78	74	0.93	0.39
F ...	29.184	29.89	28.62	25.4	37.0	31.7	31.4	62	-5	41.8	22.9	18	26	24	23	75	66	74	72	1.24	0.59
M ...	29.182	29.70	28.56	29.8	43.9	37.3	37.0	78	11	49.0	26.7	22	30	28	27	72	61	70	68	4.55	1.59
A ...	29.216	29.70	28.72	47.7	64.1	57.7	56.5	87	30	68.8	45.8	38	42	43	41	70	48	60	60	2.32	1.02
M ...	29.004	29.34	28.67	53.1	67.9	60.5	60.5	83	36	71.5	50.2	43	49	49	47	71	54	68	64	7.70	2.60
J	29.021	29.32	28.70	65.9	78.6	72.1	72.2	96	48	82.4	63.2	59	61	62	61	78	57	72	69	7.77	2.64
J	29.128	29.35	28.96	74.1	....	83.8	79.0	97	60	90.4	69.7	65	.....	70	68	73	.....	64	69	4.87	1.33
A	29.133	29.41	28.87	67.7	....	76.4	72.0	97	53	83.7	64.7	61	.....	67	64	79	.....	72	76	9.32	2.93
S	29.206	29.56	29.01	58.2	....	69.4	63.8	92	39	78.7	55.4	52	.....	55	54	80	.....	62	71	0.84	0.73
O	29.138	29.44	28.79	46.9	....	55.1	51.0	86	32	65.0	44.0	40	.....	44	42	79	.....	67	73	2.60	1.40
N ...	29.276	29.70	28.85	34.6	....	41.8	38.2	79	22	48.7	32.7	30	.....	35	32	84	...	78	81	3.50	2.08
D	29.244	29.64	28.66	29.8	....	36.4	33.1	63	10	43.8	27.7	24	.....	29	26	80	.....	75	77	1.57	1.20
Y	29.175	29.99	28.56	45.3	....	53.2	50.9	97	-21	62.5	42.6	38	.....	43	41	76	.....	70	71	47.2	....

LITTLE ROCK, ARK.

[Latitude, 34° 45′ N.; longitude, 92° 6′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Mean maximum.	Mean minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
J	29.936	30.41	29.47	33.9	42.5	39.5	38.6	75	7	47.4	30.3	29	31	32	31	82	67	78	76	4.94	1.86
F	29.752	30.27	29.27	41.1	50.3	46.3	45.9	75	18	55.2	37.3	35	36	36	35	80	61	70	70	2.49	.91
M	29.779	30.25	29.26	43.4	55.3	50.5	49.7	80	25	60.8	39.2	36	38	38	37	76	58	65	66	5.06	1.33
A	29.791	30.07	29.46	57.8	73.6	67.1	66.2	86	43	76.8	55.0	50	51	51	50	75	47	58	60	0.84	.41
M	29.597	29.87	29.38	61.1	76.9	69.3	69.1	88	45	79.5	58.0	56	58	58	57	83	53	70	69	5.09	2.18
J	29.629	29.87	29.43	70.0	81.6	75.0	75.5	92	56	84.4	67.2	67	67	68	68	90	63	80	77	7.25	1.69
J	29.716	29.88	29.61	77.5	....	85.1	81.3	97	66	91.0	72.8	71	.....	71	71	82	.....	64	73	3.78	1.36
A	29.673	29.89	29.37	73.9	....	81.0	77.4	97	63	88.1	71.8	70	....	70	70	87	.....	72	79	11.13	3.54
S	29.750	30.09	29.59	64.2	....	73.6	68.9	89	50	80.7	61.8	59	.....	62	60	83	.....	68	75	1.33	1.26
O	29.728	30.00	29.50	52.6	....	61.5	57.0	82	37	67.8	49.7	48	.....	50	49	84	.....	70	77	2.39	.54
N	29.813	30.13	29.27	45.7	....	50.9	48.3	81	32	57.1	42.7	42	.....	43	42	87	.....	76	82	8.82	4.40
D	29.849	30.19	29.33	38.6	....	46.4	42.5	69	23	52.0	36.6	34	.....	38	36	84	.....	75	79	4.43	2.06
Y	29.751	30.41	29.26	55.0	....	62.2	60.0	97	7	70.1	51.9	50	.....	51	50	83	.....	70	74	57.5	....

Monthly and yearly meteorological summaries—Continued.

LAMAR, MO.

[*H*=1028. *T*=60. *h*=51.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
4.9	5.8	3.9	4.9	8,528	36	SW.†	SW.	17	9	5	7	14	19	5	16	1	9	13	9	0	8	15	26	0	1	0	J.
5.3	6.0	4.2	5.2	8,024	42	S.	N.	20	12	5	7	17	11	7	8	0	8	13	8	0	10	3	18	0	0	0	F.
5.8	5.8	5.3	5.6	8,961	37	NW.	S.†	10	13	5	18	18	8	4	17	0	10	8	13	0	12	2	18	0	5	0	M.
4.3	4.8	2.9	4.1	8,356	37	NW.	SE.	11	12	8	18	11	17	3	10	0	11	14	5	0	7	0	1	0	3	0	A.
4.9	6.2	4.8	5.3	7,413	48	N.	S.	13	3	9	17	22	10	8	8	3	9	13	9	0	13	0	0	0	9	0	M.
4.6	6.4	3.4	4.8	5,621	36	NE.†	S.	6	6	6	24	27	6	2	6	7	9	14	7	0	11	0	0	1	9	0	J.
4.6	.....	3.3	4.0	3,666	24	S.	S.	5	5	2	8	21	6	1	1	13	15	11	5	0	3	0	0	17	2	0	J.
6.8	.....	5.2	6.0	5,103	46	NW.	NE.	10	15	12	8	9	1	1	2	4	11	8	12	0	13	0	0	5	5	0	A.
1.7	.....	1.9	1.8	3,693	28	SE.	NE.	9	12	9	9	8	3	2	4	4	24	4	2	0	3	0	0	0	1	0	S.
3.6	.....	3.2	3.4	6,074	36	SW.	S.	14	4	1	5	18	11	4	5	0	20	4	7	0	10	0	1	0	0	0	O.
5.6	.....	5.5	5.6	6,288	30	N.†	N.	17	13	3	5	11	3	1	7	0	13	1	16	0	10	1	17	0	0	0	N.
5.7	.....	3.6	4.6	5,689	26	S.†	S.	12	2	2	9	14	4	7	10	2	13	10	8	0	6	1	20	0	0	...	D.
4.8	.....	3.9	4.6	77,416	.....	....	S.	144	106	67	135	190	99	45	94	34	152	113	101	0	106	22	101	23	35	0	Y.

LANSING, MICH.

[*H*—883. *T*—44. *h*—41.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
7.4	6.9	7.7	7.4	5,731	36	SW.	NW.	3	9	3	14	7	20	12	25	0	3	12	16	0	18	26	31	0	0	0	J.
6.7	6.6	5.1	6.1	5,444	30	SW.	SW.	4	4	3	13	11	26	4	20	2	6	13	10	0	12	11	28	0	0	0	F.
6.4	6.6	4.1	5.7	6,945	34	NW.	NW.	6	8	9	10	9	8	15	26	2	6	15	10	0	12	12	29	0	0	0	M.
4.2	6.0	3.7	4.7	6,228	30	S.†	NW.	3	11	3	16	7	12	6	29	3	12	9	9	0	8	0	15	0	3	0	A.
6.7	6.8	5.2	6.2	5,647	29	SW.	SE.	0	12	7	26	5	20	11	11	1	6	13	12	0	16	6	4	0	1	1	M.
5.1	4.7	4.7	4.8	4,701	28	SW.	SW.	2	11	4	7	17	20	12	12	5	9	14	7	0	11	0	0	6	5	0	J.
4.2	.....	4.7	4.4	4,055	28	SW.	SW.†	3	10	5	11	2	11	10	7	3	12	13	6	0	9	0	0	2	3	0	J.
4.7	.....	4.4	4.6	4,493	25	SW.	SW.	5	13	2	3	4	19	6	9	1	10	13	8	0	11	0	0	0	3	0	A.
3.2	.....	3.6	3.4	4,040	24	SW.†	SW.	2	10	2	8	5	12	6	9	6	13	10	7	0	12	0	0	0	1	0	S.
7.5	.....	6.3	6.9	4,893	28	SW.	SW.	6	7	8	7	5	14	7	10	3	4	8	19	0	14	0	5	0	3	0	O.
6.2	.....	5.9	6.0	5,239	24	S.†	NW.	3	11	2	1	11	10	1	19	2	7	10	13	0	14	3	17	0	2	0	N.
7.4	.....	6.2	6.8	6,626	36	SW.	SW.	6	4	2	0	11	21	5	12	1	4	12	15	0	11	12	28	0	0	0	D.
5.8	.....	5.1	5.6	64,042	.....	....	SW.	43	110	45	116	94	193	95	189	29	92	142	132	0	148	64	157	8	21	1	Y.

LEAVENWORTH, KANS.

[*H*—842. *T*—56. *h*—49.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.0	3.9	3.0	3.9	4,865	30	NW.	N.	26	1	5	10	14	3	2	25	7	10	15	6	0	5	18	29	0	0	0	J.
4.9	6.2	3.7	4.9	5,277	28	NW.	N.	22	4	4	12	19	2	2	18	4	8	15	6	0	6	6	22	0	0	0	F.
5.1	6.6	4.4	5.4	6,354	28	S.	S.	19	5	6	16	24	2	0	21	0	11	9	11	0	11	5	21	0	0	0	M.
6.1	5.4	2.6	4.7	6,067	30	SE.	S.	21	3	2	18	22	5	0	10	9	9	15	6	0	8	0	1	0	0	0	A.
5.7	6.0	3.3	5.0	5,197	30	S.	N.	25	3	6	14	20	0	1	17	7	9	14	8	0	13	0	0	0	7	0	M.
6.0	5.4	3.5	5.0	5,228	30	NW.†	SE.†	18	2	2	26	26	2	3	5	6	6	20	4	0	15	0	0	5	9	0	J.
4.0	.....	2.2	3.1	3,924	36	SE.	S.	12	4	1	13	28	0	0	2	2	17	9	5	0	6	0	0	17	5	0	J.
5.0	.....	4.1	4.6	4,314	36	NW.†	S.	14	4	7	12	19	0	2	2	2	13	7	11	0	13	0	0	3	9	0	A.
3.6	.....	2.1	2.8	3,520	22	W.	N.	15	5	2	9	11	3	1	7	7	18	9	3	0	3	0	0	3	1	0	S.
8.5	.....	3.0	3.2	4,765	36	SW.	NW.	13	2	2	6	14	0	0	17	8	16	8	7	0	6	0	0	0	2	0	O.
5.1	.....	4.2	4.6	4,008	30	S.	S.†	12	7	2	3	12	3	0	9	12	14	4	12	0	6	2	17	0	1	0	N.
4.5	.....	4.3	4.4	5,385	30	S.	NW.	9	3	1	6	16	6	1	18	2	14	5	12	0	7	6	23	0	0	0	D.
4.9	.....	3.4	4.3	58,904	.....	....	S.	206	43	40	145	225	26	12	151	66	145	130	91	0	99	37	113	28	34	0	Y.

LITTLE ROCK, ARK.

[*H*=309. *T*=75. *h*=54.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.8	6.0	5.6	6.1	4,937	24	NW.	S.	13	14	5	4	17	11	5	13	11	10	4	17	0	11	4	20	0	0	0	J.
7.4	6.6	5.8	6.8	4,803	32	NW.	NE.	10	25	8	4	12	10	8	6	4	5	6	17	0	8	0	7	0	1	0	F.
5.7	5.7	5.3	5.6	5,309	24	NW.	NW.	12	13	7	13	16	5	8	18	1	11	5	15	0	14	0	6	0	2	0	M.
5.6	4.2	3.3	4.3	4,990	27	S.	SE.	8	20	3	23	9	15	3	8	1	12	9	9	0	6	0	0	0	1	0	A.
5.8	4.9	3.7	4.8	4,279	35	NW.	SW.	7	11	9	10	14	17	10	12	3	9	14	8	0	9	0	0	0	3	0	M.
6.1	6.2	3.3	5.2	3,252	36	N.	SE.	2	13	11	24	12	16	3	4	5	6	17	7	0	16	0	0	2	4	0	J.
2.9	.....	3.3	3.1	2,721	24	NW.†	SW.	6	10	10	10	6	14	2	3	1	13	15	3	0	10	0	0	16	6	0	J.
4.6	.....	5.2	4.9	3,738	36	SE.	NE.	7	16	12	9	9	7	2	0	0	13	7	11	0	14	0	0	11	6	0	A.
3.5	.....	2.2	2.8	3,156	19	N.	NW.	11	16	0	5	2	3	1	19	3	18	10	2	0	5	0	0	0	0	0	S.
4.2	.....	3.7	4.0	3,469	24	NW.	NW.	6	8	6	7	5	6	3	18	3	14	6	11	0	12	0	0	0	0	0	O.
7.5	.....	5.1	6.3	3,976	24	NW.	NE.	10	14	1	5	4	5	4	11	6	7	8	15	0	10	0	0	0	0	0	N.
6.0	.....	3.2	4.6	3,776	30	NE.	NW.	3	10	7	8	7	6	3	17	1	14	6	11	0	7	0	8	0	0	0	D.
5.5	.....	4.1	4.9	48,406	.....	....	NE.†	95	170	79	122	113	115	52	129	39	132	107	126	0	122	4	41	29	23	0	Y.

Monthly and yearly meteorological summaries—**Continued.**

LOS ANGELES, CAL,

[Latitude, 34° 3′ N.; longitude, 118° 15′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. in 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J.....	29.766	30.09	29.33	44.9	55.5	49.5	50.0	71	31	57.9	41.5	40	46	45	44	84	71	85	80	6.04	3.39
F ...	29.704	29.88	29.47	48.0	61.3	53.9	54.4	74	39	63.5	45.5	45	51	50	49	91	70	89	83	0.80	0.30
M ...	29.684	29.97	29.32	48.7	62.2	54.3	55.1	79	36	64.8	46.5	45	48	49	47	88	62	83	78	3.17	1.51
A ...	29.667	29.86	29.53	53.8	71.5	60.5	61.9	99	44	74.4	52.0	49	56	54	53	86	60	80	75	0.12	0.08
M ..	29.607	29.77	29.47	54.1	69.5	58.8	60.8	83	45	72.8	52.8	52	55	54	54	92	62	84	79	0.05	0.02
J.....	29.541	29.69	29.41	57.5	79.0	66.1	67.5	94	50	82.2	56.2	55	61	58	58	92	54	76	74	0.01	0.01
J.....	29.592	29.74	29.49	60.2	....	75.6	67.9	95	49	87.4	59.3	56	.....	62	59	88	.....	63	76	0.04	0.03
A ...	29.518	29.68	29.43	60.3	....	75.0	67.6	97	51	86.8	59.2	57	.....	64	60	89	....	70	79	0.10	0.08
S.....	29.510	29.68	29.32	62.2	....	74.6	68.4	98	55	86.6	61.0	58	.....	62	60	88	......	67	78	0.03	0.01
O ...	29.570	29.71	29.43	56.8	....	67.1	62.0	98	44	77.2	54.8	53	.....	59	56	88	.....	77	82	0.40	0.30
N ...	29.634	29.79	29.36	53.3	....	61.1	57.2	84	40	69.7	50.1	44	.....	51	48	76	.....	72	74	4.02	2.02
D ...	29.690	29.89	29.30	51.5	....	58.9	55.2	79	41	67.1	47.8	41	.....	49	45	70	....	72	71	6.26	2.72
Y ...	29.626	30.09	29.30	54.3	....	63.0	60.7	99	31	74.2	52.2	50	.....	55	53	86	.....	77	78	21.1	....

LOUISVILLE, KY.

[Latitude, 38° 15′ N.; longitude, 85° 45′ W.]

J.....	29.653	30.20	29.17	29.5	35.0	32.5	32.3	69	8	40.7	24.4	22	24	24	24	75	66	72	71	3.26	1.18
F ...	29.502	30.13	28.87	33.6	42.3	37.7	37.9	67	8	46.3	29.8	26	30	28	28	74	64	69	69	2.56	0.68
M ...	29.523	29.88	29.00	38.5	48.5	43.8	43.6	74	14	52.7	33.6	32	33	33	32	77	57	67	67	5.71	1.24
A ...	29.561	29.88	29.03	52.1	67.0	59.8	59.6	85	32	69.7	48.0	42	38	41	40	67	37	52	52	2.99	1.70
M ...	29.359	29.65	29.11	58.7	72.1	64.9	65.2	91	38	74.6	54.5	50	49	50	50	74	46	62	61	2.42	0.68
J.....	29.383	29.60	29.14	69.5	83.0	74.7	75.7	98	52	85.0	65.6	60	60	62	61	74	48	66	62	3.28	1.41
J.....	29.455	29.58	29.27	73.8	....	81.8	77.8	96	61	88.4	68.9	63	.....	65	64	70	.....	57	63	3.59	1.98
A ...	29.452	29.71	28.89	70.7	....	77.3	74.0	98	51	85.2	66.9	63	.....	64	64	78	.....	67	72	10.53	2.87
S.....	29.488	29.78	29.23	60.2	....	68.5	64.4	86	36	75.7	56.6	52	.....	56	54	77	.....	65	71	2.75	1.43
O.....	29.439	29.75	29.02	49.0	....	56.0	52.5	77	32	63.4	44.5	41	.....	46	44	75	.....	70	73	2.84	0.64
N....	29.560	29.87	29.07	44.4	....	50.3	47.4	78	25	57.1	40.2	36	.....	40	38	73	.....	69	71	6.34	2.12
D....	26.570	29.91	29.07	35.6	....	41.4	38.5	62	18	47.5	30.3	28	.....	29	28	74	.....	63	68	1.57	0.47
Y....	29.495	30.20	28.87	51.3	....	57.4	55.7	98	8	65.5	46.9	43	.....	45	44	74	......	65	67	47.84	....

LYNCHBURGH, VA.

[Latitude, 37° 25′ N.; longitude, 79° 9′ W.]

J ...	29.481	30.03	29.07	31.4	41.0	34.3	35.6	74	14	44.4	26.9	23	22	24	23	72	50	68	63	2.99	0.98
F ...	29.363	29.89	28.83	34.6	47.7	39.2	40.5	66	11	49.8	31.3	29	28	32	29	82	52	77	70	3.59	1.35
M ...	29.371	29.73	28.74	35.8	50.3	41.9	42.7	80	16	54.0	32.4	27	26	30	28	73	44	65	61	5.25	1.69
A....	29.427	29.89	28.97	48.0	66.5	54.5	56.3	89	31	69.0	43.2	38	34	39	37	69	34	58	54	1.67	0.78
M ...	29.282	29.58	29.04	58.8	71.0	62.1	64.0	90	41	73.7	55.6	52	51	53	52	78	54	75	69	5.75	1.43
J	29.277	29.59	29.06	68.2	82.7	71.4	74.1	96	50	84.9	63.3	60	58	63	60	76	46	75	66	2.24	1.40
J	29.368	29.56	29.03	71.8	....	76.0	73.9	95	55	86.5	64.0	61	.....	63	62	70	.....	65	67	2.59	1.30
A....	29.362	29.59	28.90	72.2	....	76.2	74.2	98	53	87.6	66.1	63	.....	65	64	74	.....	70	72	4.47	1.40
S	29.394	29.74	29.09	60.7	....	63.5	62.1	84	35	73.3	55.9	56	.....	57	56	84	.....	79	82	10.58	2.46
O ...	29.336	29.72	28.93	48.4	....	53.2	50.8	78	33	65.6	42.3	40	.....	44	42	74	.....	72	73	4.41	2.20
N....	29.456	29.94	28.93	43.4	....	47.9	45.6	76	26	59.3	39.4	36	.....	37	36	76	.....	67	72	2.74	1.10
D....	29.422	29.89	28.61	33.4	....	39.4	36.4	63	17	51.5	28.6	21	.....	25	23	63	.....	57	60	2.20	2.08
Y....	29.378	30.03	28.61	50.6	. ...	55.0	54.7	98	11	66.6	45.8	42	.....	44	43	74	.....	69	67	48.48	....

FORT MAGINNIS, MONT.

[Latitude, 47° 12′ N.; longitude, 109° 10′ W.]

J.....	25.483	25.76	25.01	6.2	15.8	12.6	11.5	60	-39	23.6	0.5	00	7	5	4	78	72	74	75	2.77	1.91
F.....	25.475	25.87	25.08	23.5	34.7	28.3	28.8	60	- 5	41.2	19.4	19	27	22	23	83	75	81	80	3.37	0.95
M....	25.484	25.80	25.16	13.0	27.5	20.0	20.2	60	-23	33.3	9.9	8	20	15	14	82	75	62	80	3.21	0.61
A.....	25.567	26.10	25.08	34.2	51.9	43.7	43.3	75	17	58.3	32.7	25	35	33	31	72	55	69	65	1.57	0.84
M....	25.530	25.90	25.19	36.3	51.7	45.9	44.6	72	29	55.0	35.6	30	37	38	35	78	63	75	72	3.21	0.76
J......	25.414	25.73	25.18	47.1	59.8	55.7	54.2	79	26	64.2	44.5	37	43	42	41	71	58	64	64	7.31	3.18
J......	25.658	25.91	25.44	57.3	....	71.9	64.6	94	45	76.5	52.4	41	.....	47	44	56	.....	44	50	0.88	0.27
A.... .	25.658	25.86	25.49	56.2	....	69.3	62.8	92	38	73.7	51.5	42	.....	43	42	63	.....	42	52	1.49	0.91
S......	25.664	26.02	25.34	53.4	....	63.9	58.6	89	33	72.1	47.0	36	.....	33	34	55	.....	36	46	0.15	0.09
O......	25.510	25.79	25.03	37.0	....	47.1	42.0	75	18	54.3	34.8	27	.....	30	28	69	......	54	62	0.98	0.80
N.....	25.556	25.78	25.22	29.0	....	34.1	31.6	59	8	44.7	24.5	18	.....	22	20	65	......	62	64	0.08	0.03
D.....	25.515	25.94	25.15	36.2	....	37.8	37.0	60	4	44.9	25.6	22	.....	25	24	59	.....	62	60	0.78	0.33
Y....	25.545	26.10	25.01	35.8	....	44.2	41.6	94	-39	53.5	31.5	25	.....	30	28	69	.....	62	64	25.7	....

Monthly and yearly meteorological summaries—Continued.

LOS ANGELES, CAL.

[*H*=330. *T*=74. *h*=66.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
4.6	4.9	3.8	4.3	4,406	33	N.	E.	1	16	22	7	9	3	11	4	1	14	8	9	0	9	0	4	0	0	0	J.
4.0	4.2	3.3	3.9	3,516	23	NE.	W.	8	18	11	8	2	9	27	4	0	14	8	7	0	5	0	0	0	0	0	F.
4.5	5.1	5.2	4.9	4,621	30	E.	W.	3	21	13	8	6	5	32	4	1	10	12	9	0	11	0	0	0	1	0	M.
4.1	4.3	4.5	4.3	4,154	28	W.	W.	4	13	5	4	6	16	40	2	0	14	8	8	0	3	0	0	2	0	0	A.
7.5	6.3	3.9	5.9	4,272	24	W.	W.	0	4	13	5	3	25	41	0	2	5	18	8	0	1	0	0	0	0	0	M.
4.5	2.0	0.8	2.4	4,084	19	W.	W.	0	13	9	3	5	21	37	0	2	17	12	1	0	0	0	0	3	0	0	J.
4.4	.....	0.8	2.6	4,136	21	W.	W.	1	8	9	1	1	2	35	2	3	17	13	1	0	1	0	0	6	0	0	J.
2.8	.....	0.2	1.5	3,851	18	W.	W.	4	5	4	5	1	2	37	1	3	23	8	0	0	1	0	0	8	1	0	A.
2.3	.....	0.8	1.6	3,518	23	W.	W.	5	4	5	3	3	3	35	2	0	21	7	2	0	0	0	0	9	0	0	S.
5.5	.....	2.5	4.0	3,407	18	SW.	W.	8	11	4	2	1	1	31	3	1	16	10	5	0	3	0	0	2	0	0	O.
4.5	.....	3.6	4.0	2,128	18	NE.	NE.	4	21	3	2	2	0	19	6	3	15	8	7	0	8	0	0	0	0	0	N.
3.2	.....	3.9	3.6	2,701	26	E.	W.	11	14	4	1	0	4	20	5	3	18	6	7	0	6	0	0	0	0	0	D.
4.3	.....	2.8	3.6	44,794	.....	....	W.	67	148	102	49	39	91	365	33	19	184	118	64	0	48	0	4	30	2	0	Y.

LOUISVILLE, KY.

[*H*=551. *T*=100. *h*=108.]

6.4	5.7	5.3	5.8	7,113	28	W.	W.	10	10	9	9	11	13	25	6	0	8	10	13	0	13	8	25	0	0	0	J.
7.2	6.7	5.5	6.4	6,175	36	S.	N.	18	15	2	7	12	12	14	7	0	6	9	14	0	15	3	15	0	1	0	F.
6.8	6.4	4.9	6.0	7,278	36	W.	N.	18	14	4	13	10	12	16	6	0	6	11	14	0	19	1	14	0	1	0	M.
3.4	4.0	1.8	3.1	6,010	35	NW.	NE.	17	20	5	15	5	12	7	8	1	18	8	4	0	7	0	0	0	3	0	A.
7.4	6.7	4.4	6.2	5,921	30	SW.	SW.	2	15	13	19	9	20	13	2	0	5	14	12	0	11	0	0	1	3	9	M.
5.2	5.5	3.6	4.8	4,720	26	SW.	SW.	8	17	5	14	11	22	10	3	0	6	18	6	0	9	0	0	6	3	0	J.
3.5	.....	3.4	3.4	4,436	21	W.†	NE.	10	17	3	2	7	13	6	3	1	15	10	6	0	9	0	0	13	2	0	J.
5.8	.....	5.7	5.8	4,319	34	W.	NE.	12	13	7	8	8	5	6	3	0	9	9	13	0	14	0	0	8	4	0	A.
3.3	.....	2.8	3.0	4,612	26	W.	NE.	9	14	5	4	11	6	7	4	0	19	4	7	0	8	0	0	0	0	0	S.
5.7	.....	5.5	5.6	5,304	24	W.†	W.	4	9	4	9	10	6	13	7	0	10	5	16	0	14	0	0	0	1	0	O.
6.0	.....	6.2	6.1	5,336	25	SW.	N.	12	10	5	5	6	9	6	7	0	8	4	18	0	12	0	5	0	1	0	N.
4.9	.....	5.2	5.0	5,812	33	SW.	W.	6	6	6	9	8	7	14	6	0	13	3	15	0	9	0	15	0	0	0	D.
5.5	.....	4.5	5.1	67,036	.....	....	NE.	126	160	68	114	108	137	137	62	2	123	105	138	0	140	12	74	28	19	0	Y.

LYNCHBURGH, VA.

[*H*=658. *T*=69. *h*=57.]

5.6	6.3	4.6	5.4	2,823	27	NW.	NW.†	3	11	6	4	4	20	11	20	14	8	15	8	0	10	7	23	0	0	0	J.
6.4	6.4	5.1	6.0	2,356	20	NW.	NW.†	1	16	7	4	6	14	4	16	19	7	9	13	0	12	0	16	0	0	0	F.
4.8	5.9	4.3	5.0	3,907	29	NW.	NW.	4	15	4	0	12	5	11	28	14	11	11	9	0	11	0	14	0	0	0	M.
3.4	4.1	2.4	3.2	2,903	26	W.	NW.	5	9	6	10	12	10	8	16	14	17	9	4	0	7	0	1	0	1	0	A.
7.4	7.0	6.9	7.1	3,264	24	SW.	NE.	5	16	9	9	13	11	3	11	16	3	11	17	0	19	0	0	0	3	0	M.
4.9	5.4	4.4	4.9	2,782	23	NW.	NE.	4	19	9	4	9	11	8	14	12	8	16	6	0	5	0	0	10	4	0	J.
4.4	.....	5.0	4.7	2,786	20	E.	SE.†	7	8	6	8	6	3	6	5	13	6	20	5	0	11	0	0	8	3	0	J.
4.0	.....	5.0	4.5	2,500	24	W.†	S.	5	5	2	6	8	5	4	5	22	7	12	12	0	12	0	0	11	3	0	A.
5.9	.....	5.6	5.8	2,809	16	NW.†	N.	12	7	2	3	2	0	5	3	26	6	11	13	0	15	0	0	0	0	0	S.
4.6	.....	3.8	4.2	2,941	22	NW.†	S.	4	6	0	4	8	3	7	5	25	9	16	6	0	12	0	0	0	0	0	O.
4,6	.....	4.2	4.4	4,052	36	NW.	NW.	9	6	2	2	4	1	5	15	16	11	11	8	0	6	0	7	0	0	0	N.
3.6	......	2.3	3.0	4,011	23	NW.	NW.	2	4	1	3	3	6	5	22	16	21	7	3	0	5	0	21	0	0	0	D.
5.0	.....	4.5	4.8	37,134	.....	....	NW.	61	122	54	57	87	89	77	160	207	114	148	104	0	125	7	82	29	14	0	Y.

FORT MAGINNIS, MONT.

[*H*=4,320. *T*=21. *h*=1.]

7.5	6.6	4.6	6.3	9,944	68	NW.	NW.	6	1	1	0	1	3	29	38	14	4	16	11	0	7	18	25	0	0	0	J.
6.5	6.3	6.2	6.4	9,006	48	NW.	NW.	5	1	1	14	0	6	10	44	6	4	11	14	0	15	3	25	0	0	4	F.
6.5	6.6	4.9	6.0	8,045	70	NW.	NW.	8	9	4	9	1	2	17	29	14	7	15	9	0	12	13	27	0	0	0	M.
4.5	5.4	4.3	4.7	8,379	48	NW.	NW.	6	5	0	4	0	5	20	45	5	8	16	6	0	7	0	16	0	0	3	A.
6.4	6.7	6.5	6.5	6,549	40	NW.	NW.	3	17	10	21	1	4	11	25	1	3	15	13	0	17	0	8	0	0	3	M.
6.5	6.2	6.9	6.5	9,303	84	NW.	NW.	1	6	4	25	1	5	4	42	2	1	19	10	0	18	0	2	0	0	0	J.
2.9	.....	3.6	3.2	5,124	48	NW.	NW.	0	4	3	13	2	3	12	18	7	17	10	4	0	7	0	0	1	0	0	J.
2.9	.....	4.2	3.6	5,308	33	S.	NW.	0	7	2	12	1	4	10	24	2	13	14	4	0	8	0	0	1	2	4	A.
1.6	.....	2.9	2.2	5,772	45	NW.	NW.	0	4	0	10	1	8	2	28	7	18	9	3	0	3	0	0	0	3	0	S.
4.5	.....	5.4	5.0	8,608	54	NW.	NW.	0	2	2	7	0	10	5	36	0	12	14	5	0	11	0	9	0	0	0	O.
2.8	.....	2.1	2.4	6,714	45	SW.	NW.	2	0	2	2	0	8	7	35	4	21	8	1	0	1	3	22	0	0	0	N.
3.1	.....	3.5	3.3	8,073	48	NW.	NW.	4	0	0	1	1	0	0	51	5	14	1	16	0	8	5	21	0	0	0	D.
4.6	.....	4.6	4.7	90,825	.....	....	NW.	35	56	29	118	9	58	127	415	67	122	148	96	0	114	42	155	2	5	14	Y.

Monthly and yearly meteorological summaries—Continued.

GRAND HAVEN, MICH.

[Latitude, 43° 5′ N.; longitude, 86° 18′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	Maximum.	Minimum.	Mean.		7 a.m.	8 p.m.	10 p.m.	Mean.	7 a.m.	3 p.m.	10 p.m.	Mean.	Total.	Max. 24 hours.
										Maximum.	Minimum.										
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J....	29.486	30.12	28.75	15.6	18.4	16.9	17.0	40	-5	23.5	11.8	13	14	15	14	89	85	90	88	2.20	.76
F .	29.325	30.16	28.46	18.2	23.6	21.8	21.2	44	-7	29.3	14.1	16	19	18	18	91	82	88	87	1.45	.50
M...	29.408	29.82	28.76	21.7	27.1	24.5	24.4	64	1	32.0	17.8	18	20	20	19	86	74	84	81	2.40	.65
A....	29.453	29.80	28.84	37.7	44.9	42.0	41.5	74	23	49.9	34.4	30	31	31	31	75	60	68	68	1.54	.69
M...	29.250	29.64	28.88	46.5	53.2	50.5	50.1	78	30	58.5	42.1	39	41	41	40	77	65	72	72	3.01	.80
J....	29.267	29.60	29.00	60.5	65.5	63.6	63.2	90	39	71.3	55.6	54	54	55	54	80	67	74	74	1.48	.74
J....	29.368	29.55	29.14	66.1	......	69.8	67.9	84	49	75.8	60.1	58	.....	58	58	74	......	68	71	1.59	.78
A ...	29.354	29.63	29.09	63.2	......	65.6	61.4	80	46	71.6	58.1	56	.....	56	56	79	......	73	76	2.59	.81
S	29.377	29.68	28.92	52.3	......	57.4	54.8	74	37	63.1	47.2	47	.....	48	48	83	......	73	78	2.58	.93
O ...	29.287	29.69	28.75	43.7	......	47.0	45.4	64	33	52.1	39.4	38	.....	38	38	81	......	73	77	2.00	.68
N....	29.444	29.97	28.90	37.0	......	40.1	38.6	72	18	44.5	33.7	32	.....	32	32	82	......	75	78	3.06	1.62
D....	29.336	29.77	28.76	30.9	......	33.2	32.0	50	17	37.0	27.6	26	.....	26	26	81	......	74	78	2.06	.79
Y.....	29.365	30.16	28.46	41.1	......	44.4	43.4	90	-7	50.7	36.8	36	.....	37	36	82	......	76	77	26.0	......

FORT GRANT, ARIZ.

[Latitude, 32° 39′ N.; longitude, 109° 57′ W.]

J.....	25.214	25.52	24.98	35.2	51.8	42.9	43.3	67	19	55.1	33.5	19	25	24	22	54	37	47	46	.12	.06
F....	25.154	25.34	24.89	39.0	55.0	46.9	47.0	68	29	57.1	37.4	24	30	28	28	55	40	50	48	.44	.21
M...	25.145	25.40	24.87	39.7	56.1	48.9	48.2	71	27	59.7	37.7	22	24	24	23	50	32	40	41	.83	.30
A....	25.244	25.42	25.05	53.8	70.2	60.6	61.5	82	41	73.0	50.8	25	30	31	29	34	24	33	31	.50	.50
M...	25.154	25.34	25.06	55.6	73.3	64.3	64.4	86	44	76.3	52.7	29	34	31	31	38	25	30	31	.18	.18
J....	25.173	25.31	25.02	66.5	85.0	74.8	75.4	92	58	87.8	63.8	26	35	31	31	22	18	20	20	.02	.02
J....	25.272	25.42	25.16	71.3	......	81.2	76.8	98	60	90.1	68.2	31	.....	47	39	24	.....	34	29	4.27	1.18
A....	25.268	25.42	25.17	70.5	......	84.9	77.7	96	60	90.8	67.4	38	.....	46	42	31	.....	27	29	.52	.50
S.....	25.274	25.41	25.14	66.9	......	77.7	72.3	91	53	83.1	62.2	39	.....	45	42	37	.....	33	35	.78	.76
O ...	25.216	25.40	25.08	57.6	......	68.3	63.0	87	33	75.1	54.1	36	.....	39	37	46	.....	39	42	1.19	.93
N....	25.204	25.38	25.01	45.9	......	52.3	49.1	73	30	59.2	42.5	32	.....	32	32	64	.....	51	57	3.67	1.88
D....	25.256	25.53	25.00	39.0	......	46.5	42.8	62	30	53.6	35.7	30	.....	34	32	72	.....	62	67	1.68	.60
Y....	25.215	25.53	24.87	53.4	......	62.4	60.1	98	19	71.7	50.5	29	.....	34	32	44	.....	39	40	14.2	......

GREEN BAY, WIS.

[Latitude, 44° 31′ N.; longitude, 88° 0′ W.]

J.....	29.527	30.16	28.62	0.5	10.2	5.8	5.5	36	-36	14.5	-4.2	-3	5	3	2	86	80	88	84	2.38	0.87
F ...	29.344	30.22	28.57	10.6	19.8	15.1	15.2	43	-27	23.7	5.8	8	15	12	12	89	82	90	87	2.11	0.62
M...	29.439	29.92	28.78	14.5	25.5	20.8	20.3	44	-8	28.2	10.9	11	18	18	16	88	74	90	84	5.69	2.80
A ...	29.469	29.87	28.94	35.2	44.3	38.7	39.4	82	21	47.3	31.6	32	31	34	32	88	63	86	79	2.90	1.24
M...	29.255	29.74	28.82	45.9	55.2	48.0	49.7	78	28	58.4	40.6	41	43	43	42	85	67	83	78	3.79	0.69
J.....	29.250	29.64	28.92	63.1	73.0	65.0	67.0	92	38	76.4	56.6	56	57	59	57	79	59	80	73	1.14	0.69
J.....	29.360	29.54	29.17	67.0	......	71.7	69.4	90	52	79.7	59.9	59	.....	60	60	76	.....	69	72	3.13	1.16
A ...	29.344	29.64	29.04	61.8	......	67.7	64.8	89	40	75.8	56.3	56	.....	58	57	83	.....	71	77	2.39	0.87
S	29.370	29.72	28.81	52.6	......	58.5	55.6	80	32	66.2	47.7	48	.....	49	49	85	.....	72	79	5.36	3.98
O ...	29.292	29.71	28.79	41.2	......	44.8	43.0	69	25	51.6	37.5	37	.....	40	38	85	.....	85	85	1.45	0.64
N ...	29.469	30.03	29.02	33.0	......	37.2	35.1	64	9	42.3	30.2	29	.....	32	30	86	.....	82	84	2.12	1.15
D ...	29.353	29.81	28.56	24.5	......	29.1	26.8	49	5	32.4	21.3	20	.....	23	22	84	.....	78	81	3.01	0.85
Y ...	29.373	30.22	28.56	37.5	......	41.9	41.0	92	-36	49.7	32.8	33	.....	36	34	84	.....	81	80	35.5	......

HARRISBURG, PA.

[Latitude, 40° 16′ N.; longitude, 76° 52′ W.]

J....	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
F ...	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
M ...	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
A....	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
M ...	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
J	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
J	29.658	29.85	29.31	68.6	......	74.5	71.5	91	54	81.5	63.0	60	.....	63	61	74	.....	69	72	3.27	1.40
A....	29.630	29.90	29.08	68.6	......	74.2	71.4	95	51	82.1	63.7	62	.....	64	63	80	.....	71	76	6.28	4.70
S....	29.608	30.19	29.28	58.6	......	62.1	60.4	81	36	68.1	55.2	53	.....	55	54	83	.....	80	81	4.47	1.63
O ...	29.612	29.99	29.06	45.4	......	49.7	47.6	69	35	55.5	42.2	39	.....	40	40	79	.....	72	76	2.04	0.39
N ...	29.764	30.34	29.13	40.9	......	44.9	42.9	74	19	50.4	36.8	34	.....	37	36	79	.....	74	77	2.31	0.75
D ...	29.694	30.22	28.68	31.5	......	35.4	33.4	54	11	40.1	28.2	24	.....	26	25	76	.....	70	73	2.50	1.20
Y....	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......

Monthly and yearly meteorological summaries—**Continued.**

GRAND HAVEN, MICH.

[*H*=620. *H*=86. *h*=75.]

Cloudiness (in tenths).				Wind.											Number of days—												
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and years.
8.7	9.2	9.4	9.1	8,697	52	SW.	SE.	13	9	16	18	3	10	7	17	0	0	7	24	0	23	27	31	0	0	0	J.
8.5	7.6	7.3	7.8	7,821	36	W.	W.	10	2	16	12	14	6	20	7	0	1	10	18	0	13	13	29	0	0	0	F.
8.1	7.2	5.3	6.9	9,801	42	NW.	NW.	12	11	12	13	5	6	14	20	0	3	13	15	0	13	15	30	0	0	1	M.
5.7	5.9	4.3	5.3	8,820	36	NW.†	NW.	10	7	13	9	14	6	8	23	0	9	10	11	0	8	0	12	0	2	2	A.
5.9	6.8	6.4	6.4	7,526	30	SW.	W.	4	7	15	14	14	10	17	12	0	7	10	14	0	15	0	1	0	5	1	M.
5.5	5.8	5.7	5.6	7.183	36	S.	SW.	3	4	10	8	19	20	14	12	0	7	12	11	0	6	0	0	1	3	0	J.
5.6	.....	5.8	5.7	5,802	30	NE.	NW.	3	9	4	11	8	8	7	12	0	10	12	9	0	9	0	0	0	5	0	J.
5.4	.....	4.9	5.2	7,380	36	W.	S.	5	6	8	4	12	10	6	11	0	13	11	7	0	10	0	0	0	6	0	A.
5.2	.....	3.5	4.4	6,773	39	W.	SW.	8	4	6	10	4	12	7	8	1	12	7	11	0	12	0	0	0	4	0	S.
7.5	.....	6.3	6.9	9,198	42	NW.†	NE.	11	13	7	7	8	1	8	7	0	10	2	19	0	13	0	3	0	2	0	O.
5.9	.....	6.5	6.2	8,573	36	W.†	NE.	9	11	7	5	10	6	3	9	0	8	9	13	0	12	1	14	0	1	0	N.
8.9	.....	6.5	7.7	11,169	48	SW.	NE.	7	11	4	6	10	10	9	5	0	1	11	19	0	9	8	25	0	0	0	D.
6.7	....	6.0	6.4	98,743	.....	....	NE.†	95	94	118	117	121	107	120	143	1	81	114	171	0	143	64	145	1	28	4	Y.

FORT GRANT, ARIZ.

[*H*=4,916 B. *T*=15. *h*=4.]

3.9	3.8	4.3	4.0	4,512	48	W.	N.	22	8	2	10	7	8	16	19	1	12	14	5	0	2	0	14	0	0	0	J.
4.4	3.9	3.8	4.1	4,972	36	SE.	NW.	13	12	8	6	7	8	14	19	0	10	15	4	0	7	0	3	0	0	0	F.
3.3	3.7	3.2	3.4	3,461	48	SE.	W.	15	8	8	8	7	9	19	18	1	14	12	5	0	5	0	4	0	0	0	M.
2.5	3.8	2.5	3.0	5,024	40	SE.	N.	23	11	10	10	5	5	9	17	0	17	10	3	0	1	0	0	0	1	0	A.
1.2	2.2	1.6	1.7	4,384	30	E.	NW.	14	10	5	6	9	11	14	24	0	25	4	2	0	2	0	0	0	0	0	M.
1.1	2.1	1.3	1.5	3,739	24	W.†	NW.	16	10	3	4	4	6	17	30	0	24	4	2	0	1	0	0	6	0	0	J.
3.7	.....	6.7	5.2	4,120	42	SE.	NW.†	12	9	10	6	2	2	7	12	2	7	12	12	0	16	0	0	17	13	0	J.
1.5	.....	2.9	2.2	4,152	30	SE.	NW	10	6	8	9	0	3	11	15	0	22	8	1	0	2	0	0	19	1	0	A.
1.6	.....	2.6	2.1	5,763	30	W.†	SE.	5	5	12	23	3	0	5	7	0	22	4	4	0	3	0	6	1	0	0	S.
1.7	.....	2.3	2.0	3,376	30	S.	NW.	12	13	6	4	1	1	4	15	6	22	5	4	0	3	0	0	0	1	0	O.
3.7	.....	4.2	4.0	5,057	36	E.†	NE.	11	14	10	8	3	1	0	13	0	15	6	9	0	9	0	1	0	0	0	N.
3.5	.....	3.0	3.2	4,014	40	E.	N.	14	9	12	2	3	1	9	11	1	17	6	8	0	5	0	4	0	0	0	D.
2.7	.....	3.2	3.0	52,574	.....	....	NW.	167	115	94	96	51	55	125	200	11	207	100	59	0	56	0	26	43	16	0	Y.

GREEN BAY, WIS.

[*H*=616. *T*=50. *h*=41.]

6.3	6.5	5.9	6.2	5,396	30	W.	SW.	10	10	2	3	5	35	14	12	2	5	14	12	0	16	29	31	0	0	1	J.
7.4	6.8	6.6	7.0	4,921	27	NE.	S.	9	7	1	4	34	10	9	7	6	6	8	15	0	12	18	29	0	0	1	F.
5.9	7.1	5.4	6.1	6,165	32	W.	NE.	16	21	5	12	16	4	14	4	1	6	10	15	0	11	18	30	0	0	0	M.
6.5	7.0	5.6	6.4	6,511	36	NE.†	N.	16	13	5	15	13	6	8	12	2	4	13	13	0	10	0	17	0	1	2	A.
6.9	8.2	6.7	7.3	6,083	24	SW.†	SE.†	20	11	9	20	11	7	10	4	1	2	13	16	0	14	0	4	0	1	0	M.
6.0	7.7	4.7	6.1	5,784	26	S.	S.	8	8	7	18	33	10	3	3	0	5	15	10	0	7	0	0	3	3	0	J.
6.4	.....	6.1	6.2	4,835	36	W.	S.	6	11	9	10	17	6	2	1	0	3	16	12	0	9	0	0	1	5	0	J.
5.7	.....	4.6	5.2	5,454	42	SW.	S.	6	7	6	8	17	11	3	2	2	8	13	10	0	9	0	0	0	2	1	A.
4.5	.....	5.3	4.9	5,343	36	NW.	S.	9	3	6	8	13	5	8	8	0	9	11	10	0	11	0	0	0	1	0	S.
7.2	.....	6.6	6.9	6,097	30	N.	N.	11	5	7	10	10	9	2	8	0	4	10	17	0	10	0	5	0	0	0	O.
7.0	.....	6.1	6.6	5,282	32	N.	S.	13	1	3	5	15	4	4	9	6	3	15	12	0	6	2	16	0	2	0	N.
7.8	.....	6.1	7.0	6,988	34	N.	S.	5	2	0	3	26	4	10	9	3	5	10	16	0	8	13	30	0	0	0	D.
6.5	.....	5.8	6.3	68,859	.....	....	S.	129	99	60	116	210	111	87	79	23	60	148	158	0	123	80	162	4	15	5	Y.

HARRISBURG, PA.

[*H*=361. *T*=94. *h*=87.]

.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	J.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	F.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	M.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	A.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	M.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	J.
4.5	.....	5.0	4.8	3,885	24	NW.	W.	10	3	3	3	14	9	15	5	0	10	10	11	0	7	0	0	1	0	0	J.
5.1	.....	4.1	4.6	4,074	28	N.	W.	8	3	2	1	8	8	18	9	5	11	10	10	0	12	0	0	4	1	0	A.
5.8	.....	6.1	6.0	3,773	23	NW.	NW.†	12	7	7	5	2	1	10	12	4	3	11	16	0	9	0	0	0	0	0	S.
6.6	.....	5.3	6.0	5,534	30	NW.	NW.	2	5	5	9	4	6	10	20	1	8	7	16	0	16	0	0	0	0	0	O.
6.6	.....	6.1	6.4	5,308	36	NW.†	NE.	7	12	5	10	0	3	10	11	2	7	7	16	0	11	1	9	0	0	0	N.
6.3	.....	4.2	5.2	6,230	42	N.	NW.	5	7	3	3	1	14	8	19	2	8	8	15	0	7	5	20	0	0	0	D.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	Y.

Monthly and yearly meteorological summaries—Continued.

NEW HAVEN, CONN.

[Latitude, 41° 18′ N.; longitude 72° 56′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Mean. Maximum.	Mean. Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
	In.	*In.*	*In.*	°	°	°	°	°	°	°	°	°	°	°	°	°				*In.*	*In.*
J. ...	30.023	30.73	29.24	16.9	24.7	19.8	20.5	53	–4	28.5	12.7	12	15	14	14	82	68	77	76	5.48	2.28
F....	29.963	30.48	29.42	23.6	32.4	27.4	27.8	49	–2	36.3	19.3	19	21	21	20	81	65	76	74	3.16	1.00
M...	29.895	30.43	29.10	25.7	34.1	28.4	29.4	55	5	37.0	22.0	20	21	21	21	78	63	76	72	7.46	2.80
A ...	29.980	30.44	29.43	39.5	50.1	42.5	44.0	78	25	51.8	34.8	32	35	33	33	76	58	71	68	2.57	1.26
M...	29.894	30.20	29.61	51.8	59.9	53.4	55.0	80	32	62.8	48.4	47	50	49	49	85	72	85	81	6.03	1.52
J. ...	29.813	30.14	29.54	64.1	74.4	64.8	67.8	91	48	77.7	58.4	57	59	58	58	79	60	79	73	2.15	1.50
J.....	29.892	30.16	29.43	67.2	....	69.4	68.3	90	51	77.8	59.7	58	...	62	60	74	...	78	76	1.76	0.53
A ...	29.860	30.18	29.38	69.1	....	69.4	69.2	91	50	78.8	62.0	62	...	62	62	78	...	78	78	7.10	5.67
S.....	29.950	30.52	29.36	58.5	....	60.3	59.4	78	32	68.4	53.8	54	...	55	55	85	...	84	84	7.68	1.97
O....	29.843	30.34	20.35	44.9	....	47.9	46.4	66	30	55.2	40.1	40	...	42	41	83	...	80	82	6.46	2.61
N ...	30.010	30.69	29.18	39.7	....	43.2	41.4	67	11	50.0	36.1	36	...	38	37	88	...	83	86	4.73	1.95
D....	29.910	30.48	28.77	30.2	....	33.0	31.6	54	5	39.7	26.0	26	...	27	26	84	...	78	81	5.68	3.75
Y....	29.920	30.73	28.77	44.3	....	46.6	46.7	94	–4	55.3	39.4	39	...	40	40	81	...	79	78	60.3	....

NEW LONDON, CONN.

[Latitude, 41° 21′ N.; longitude, 72° 5′ W.]

J....	30.058	30.76	29.22	19.4	27.3	23.1	23.3	56	–3	32.0	14.9	14	18	17	16	80	69	78	76	4.78	2.85
F ...	30.011	30.45	29.49	26.2	35.0	29.5	30.2	50	–1	38.2	22.1	22	26	25	24	86	72	85	81	2.33	0.66
M ...	29.931	30.50	29.00	28.4	37.5	31.1	32.3	58	12	39.4	25.2	24	27	26	26	82	68	84	78	5.96	1.88
A....	30.026	30.48	29.48	41.8	49.7	42.4	44.6	68	26	52.6	37.3	34	35	36	35	76	61	78	72	2.26	0.94
M ...	29.942	30.25	29.66	53.0	59.5	53.7	55.4	77	36	62.1	49.1	48	49	50	49	84	72	86	81	4.90	1.65
J	29.857	30.19	29.58	64.4	72.4	64.9	67.2	92	50	75.8	59.1	57	59	57	58	77	64	75	72	1.28	0.66
J	29.932	30.20	29.42	68.5	....	68.5	68.5	86	54	75.7	61.1	59	.....	60	60	72	.....	76	74	1.35	0.33
A....	29.906	30.22	29.55	70.6	....	69.3	70.0	88	54	77.3	63.5	64	.....	62	63	79	.....	79	79	3.81	2.01
S	30.003	30.56	29.29	60.3	....	61.1	60.7	79	35	67.6	54.2	55	.....	56	56	83	.....	82	83	7.32	1.80
O	29.888	30.40	29.36	49.1	....	49.8	49.4	65	32	56.2	42.4	42	.....	42	42	77	.....	75	76	3.77	1.37
N ..	30.054	30.73	29.21	44.4	....	45.7	45.0	65	14	51.4	38.1	38	.. ..	39	38	78	.....	78	78	5.46	1.77
D....	29.947	30.53	28.78	34.0	....	34.9	34.4	53	9	41.7	28.6	27	.....	27	27	76	.....	74	75	2.39	0.92
Y....	29.963	30.76	28.78	46.7	....	47.8	48.4	92	–3	55.8	41.3	40	.....	41	41	79	.....	79	77	45.61	....

NEW ORLEANS, LA.

[Latitude, 29° 58′ N.; longitude, 90° 4′ W.]

J.....	30.187	30.52	29.83	51.6	60.6	54.6	55.6	80	29	64.9	48.1	48	48	50	49	87	66	85	79	3.29	1.64
F ...	30.003	30.42	29.68	54.8	62.9	58.0	58.6	79	35	65.9	52.1	52	52	52	52	89	69	82	80	11.21	4.21
M...	30.053	30.44	29.66	55.0	65.8	60.2	60.3	78	41	69.3	52.6	50	48	52	50	83	57	76	72	6.45	2.02
A	30.082	30.27	29.90	64.7	76.2	68.8	69.9	85	56	78.4	63.3	61	62	62	62	89	63	80	77	1.89	0.58
M...	29.893	30.06	29.67	67.9	78.6	72.0	72.8	88	60	83.2	65.9	64	65	64	64	89	65	77	77	9.75	1.97
J.....	29.920	30.14	29.58	74.0	81.6	76.4	77.8	92	66	86.0	72.4	71	69	70	70	89	67	80	79	9.09	4.44
J.....	29.971	30.08	29.82	79.5	....	83.5	81.5	96	72	90.7	76.4	73	.....	73	73	82	.....	72	77	2.02	0.50
A....	29.930	30.10	29.54	77.4	....	79.0	78.2	94	70	87.4	74.6	74	.....	74	74	90	.....	84	87	22.74	8.90
S	29.939	30.26	29.80	72.7	....	77.6	75.2	91	56	84.9	70.3	68	.....	67	68	86	.....	72	79	4.15	1.22
O....	29.974	30.23	29.73	64.5	....	71.4	68.0	87	55	78.9	62.7	60	.....	62	61	86	.....	73	80	7.36	4.13
N.....	30.044	30.28	29.61	56.3	....	61.9	59.1	85	41	68.9	54.8	53	.....	52	52	88	.....	71	80	1.50	0.60
D....	30.106	30.43	29.60	47.8	....	54.7	51.2	72	31	61.5	46.0	44	.....	45	44	86	.....	71	78	3.68	1.20
Y ...	30.008	30.52	29.54	63.8	....	68.2	67.3	96	29	76.7	61.6	60	.....	60	60	87	.....	77	79	83.1	....

NEW YORK CITY.

[Latitude, 40° 30′ N.; longitude, 74° 00′ W.]

J.....	29.946	30.62	29.25	23.4	28.6	25.6	25.9	54	2	33.1	18.8	17	19	16	17	76	68	68	71	5.14	1.58
F....	29.872	30.38	29.29	27.7	35.6	31.4	31.6	55	3	39.9	23.8	22	27	24	25	81	73	77	77	4.03	1.94
M...	29.838	30.35	29.18	28.3	36.6	31.2	32.0	63	5	40.9	24.9	22	26	24	24	78	67	76	74	5.64	1.88
A ...	29.912	30.36	29.38	43.0	54.1	46.7	47.9	84	29	57.3	39.4	34	36	35	35	72	51	64	63	3.57	1.35
M...	29.808	30.12	29.53	54.8	62.2	56.8	57.9	82	41	66.9	51.7	49	50	50	49	80	67	78	75	4.87	1.73
J.....	29.738	30.04	29.48	66.0	79.2	68.9	71.4	96	52	82.2	61.5	58	61	61	60	78	54	77	70	1.68	0.73
J.....	29.819	30.06	29.40	68.5	....	72.5	70.5	90	55	81.5	63.6	58	.....	61	60	71	.....	69	70	1.27	0.39
A ...	29.800	30.10	29.21	70.0	....	73.3	71.6	96	53	84.2	65.3	61	....	63	62	74	.....	72	73	6.35	3.93
S.....	29.881	30.41	29.37	61.7	....	64.1	62.9	84	41	74.2	58.1	55	.....	57	56	78	.....	78	78	7.40	1.64
O....	29.780	30.23	29.29	47.6	....	50.9	49.2	69	35	58.5	43.9	39	.....	41	40	74	.....	71	72	4.14	1.88
N ...	29.932	30.59	29.06	43.3	....	47.1	45.2	72	18	53.7	40.0	35	.....	40	38	74	.....	77	75	4.81	1.55
D ...	29.844	30.40	28.93	32.7	....	36.0	34.4	56	9	42.6	29.4	25	.....	28	27	74	.....	74	74	4.05	2.82
Y ...	29.848	30.62	28.93	47.2	....	50.4	50.0	96	2	59.6	43.4	40	.....	42	41	76	.....	73	73	53.00	....

***Monthly and yearly meteorological summaries*—Continued.**

NEW HAVEN, CONN.

[*H*=107. *T*=112. *h*=109.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.5	4.9	3.6	4.7	6,651	36	S.	NW.	18	13	1	2	1	10	22	25	1	10	14	7	0	13	22	31	0	0	0	J.
5.0	5.4	4.3	4.9	5,894	48	E.	N.	24	14	2	6	5	9	10	15	2	9	12	8	0	10	7	25	0	0	0	F.
4.6	6.1	3.9	4.8	8,070	48	N.	NW.	15	7	3	3	12	6	9	34	4	13	9	9	0	12	9	24	0	0	0	M.
4.7	5.8	3.3	4.6	5,463	30	W.	NW.	18	1	2	9	10	8	12	20	10	9	15	6	0	10	0	11	0	1	1	A.
6.8	7.4	5.4	6.5	5,094	27	E.	NE.	13	18	5	15	14	11	3	10	4	4	13	14	0	21	0	0	0	3	1	M.
5.2	4.1	3.1	4.1	4,644	24	N.	S.	12	7	7	2	23	17	7	8	7	10	18	2	0	8	0	0	1	4	1	J.
3.7	.....	4.5	4.1	4,802	27	W.	NE.†	11	12	2	3	12	10	3	9	0	13	10	8	0	11	0	0	0	3	0	J.
5.0	.....	4.9	5.0	4,819	43	NE.	SW.	3	4	2	4	7	21	10	8	3	13	10	8	0	11	0	0	1	3	0	A.
6.6	.....	4.5	5.6	5,052	28	N.	N.	17	11	3	5	6	6	2	9	1	7	10	13	0	14	0	1	0	1	0	S.
6.5	.....	4.7	5.6	5,366	28	NW.	NW.	7	6	0	2	5	7	9	22	4	8	10	13	0	15	0	2	0	2	0	O.
4.4	.....	5.3	4.8	7,183	51	NE.	NE.	14	16	2	0	7	10	6	5	0	10	5	15	0	13	2	9	0	0	0	N.
5.6	.....	3.5	4.6	6,424	33	NW.	SW.	11	2	0	0	4	19	12	12	2	13	9	9	0	9	5	22	0	0	0	D.
5.3	.....	4.2	4.9	69,462	.....	....	NW.	163	111	29	51	106	134	105	177	38	119	135	112	0	147	45	125	2	17	3	Y

NEW LONDON, CONN.

[*H*=47. *T*=29. *h*=58.]

4.0	4.3	3.1	3.8	6,447	48	SE.	NW.	30	3	2	4	2	0	5	47	0	14	12	5	0	12	15	31	0	0	0	J.
3.1	4.2	4.0	3.8	5,215	38	SE.	NW.	25	6	5	8	1	8	6	26	2	12	12	5	0	8	6	24	0	0	0	F.
3.5	5.2	4.1	4.2	7,253	50	S.	NW.	33	6	3	4	4	5	1	35	2	15	8	8	0	13	6	21	0	0	0	M.
3.9	4.4	2.4	3.5	5,309	36	SE.	NW.	10	0	3	6	19	4	8	36	4	14	11	5	0	10	0	3	0	2	0	A.
6.1	7.2	5.7	6.3	4,944	32	SE.	S.	12	15	2	18	19	11	5	10	1	5	16	10	0	18	0	0	0	1	0	M.
5.5	5.5	4.3	5.0	3,983	22	E.	S.&W.	9	4	5	5	14	13	14	12	14	6	21	3	0	6	0	0	1	2	0	J.
4.5	.....	4.4	4.4	4,172	24	SW.	SW.	9	5	3	3	9	14	9	7	3	7	19	5	0	11	0	0	0	1	0	J.
5.8	.....	4.4	5.1	3,933	48	SE.	W.	6	3	0	7	4	12	17	9	4	6	20	5	1	9	0	0	0	4	0	A.
7.0	.....	4.5	5.8	4,392	30	SW.	N.	15	8	1	8	4	5	4	11	4	4	17	9	0	18	0	0	0	2	0	S.
6.0	.....	5.1	5.6	5,622	36	NE.	NW.	8	5	2	4	1	9	11	21	1	7	15	9	0	14	0	0	0	0	0	O.
5.4	.....	5.5	5.4	6,234	36	NE.	NE.	6	13	3	1	2	12	11	11	1	9	10	11	0	13	0	7	0	0	0	N.
5.5	.....	3.6	4.6	6,483	40	SE.	W.	6	1	0	3	3	13	20	15	1	9	15	7	0	6	4	16	0	0	0	D.
5.0	.....	4.3	4.8	63,987	.....	....	NW.	159	69	29	71	82	106	111	240	37	108	176	82	1	138	31	102	1	12	0	Y.

NEW ORLEANS, LA.

[*H*=52. *T*=87. *h*=77.]

5.3	6.5	6.0	5.9	5,628	30	N.†	N.	27	12	10	17	15	2	4	5	1	8	11	12	0	11	0	1	0	0	0	J.
5.8	6.5	3.9	5.4	5,031	26	NW.†	N.	19	8	17	16	4	9	9	5	0	6	18	5	0	13	0	0	0	4	0	F.
6.8	5.6	3.0	5.2	7,260	33	S.	SE.	19	9	9	24	14	5	6	7	0	7	17	7	0	13	0	0	0	2	0	M.
5.0	4.9	3.3	4.4	5,201	26	N.	E.	7	7	22	16	16	12	6	3	1	8	21	1	0	8	0	0	0	1	0	A.
3.8	5.2	2.0	3.7	5,179	48	NW.	SE.	10	7	11	21	20	7	6	9	2	15	11	5	0	12	0	0	0	8	0	M.
5.3	6.5	2.6	4.8	4,911	36	S.	SE.	3	10	16	27	11	13	5	4	1	8	15	7	0	13	0	0	3	2	0	J.
2.5	.....	4.4	3.4	4,458	36	S.	SE.	7	2	6	15	3	14	10	5	0	17	12	2	0	13	0	0	16	2	0	J.
4.7	.....	5.7	5.2	5,958	60	E.	SW.	7	3	6	11	11	16	0	1	7	0	17	14	0	25	0	0	8	5	0	A.
3.3	.....	4.6	4.0	4,534	24	E.†	N.	20	7	3	12	5	2	3	6	2	16	10	4	0	12	0	0	2	2	0	S.
3.5	.....	3.0	3.2	5,349	26	W.	N.	13	3	4	9	9	8	3	11	2	17	8	6	0	7	0	0	0	1	0	O.
5.2	....	3.5	4.4	5,734	33	S.	NE.†	12	12	5	8	2	9	4	7	1	11	13	6	0	10	0	0	0	0	0	N.
4.2	....	2.1	3.2	6,347	39	SE.	W.	11	7	7	11	1	5	17	2	1	19	3	9	0	11	0	1	0	0	0	D.
4.6	.....	3.7	4.4	65,590	.....	....	SE.†	155	87	116	187	111	102	73	65	18	132	156	78	0	148	0	2	29	27	0	Y.

NEW YORK CITY.

[*H*=185. *T*=148. *h*=155.]

5.9	6.3	4.7	5.6	10,173	60	W.	W.	6	13	2	5	3	8	38	18	0	8	13	10	0	14	12	31	0	0	0	J.
5.7	5.6	4.7	5.3	7,526	38	W.	W.	4	17	7	3	5	15	23	13	0	6	15	8	0	11	4	22	0	0	0	F.
5.5	5.[illegible]	5.6	5.6	10,470	50	W.	NW.	5	10	1	9	5	12	17	34	0	11	9	11	0	15	6	22	0	0	0	M.
3.9	5.1	3.2	4.1	7,440	52	SE.	W.	6	4	6	11	15	14	18	16	0	14	11	5	0	11	0	4	0	1	0	A.
6.6	8.3	6.5	7.2	5,980	34	NW.	S.	10	19	8	11	24	5	9	6	1	1	14	16	0	21	0	0	0	5	0	M.
4.7	5.8	4.6	5.0	5,996	48	NW.	S.	13	6	0	4	34	10	12	11	0	6	20	4	0	7	0	0	4	6	0	J.
4.1	.....	6.0	5.0	6,225	48	NW.	S.	8	6	3	5	18	9	10	3	0	11	13	7	0	8	0	0	0	1	0	J.
3.8	.....	4.5	4.2	6,668	48	W.	S.	8	2	3	7	18	12	6	6	0	4	24	3	0	9	0	0	3	5	0	A.
6.5	.....	5.3	5.9	5,939	25	W.†	NE.	4	15	4	3	12	6	7	9	0	2	14	14	0	15	0	0	0	7	0	S.
5.8	.....	4.4	5.1	8,127	50	W.	W.	6	5	2	6	7	12	21	3	0	2	18	11	0	15	0	0	0	2	0	O.
4.6	.....	5.7	5.2	7,805	48	W.	S.	7	8	2	2	12	7	11	11	0	9	10	11	0	12	0	7	0	0	0	N.
5.6	.....	3.7	4.6	9,519	50	SW.	SW.	3	1	1	5	11	21	15	5	0	12	11	8	0	8	4	16	0	0	0	D.
5.2	.....	4.9	5.2	91,868	.....	....	W.†	80	106	39	71	164	131	187	135	1	86	172	108	0	146	26	102	7	27	0	Y.

Monthly and yearly meteorological summaries—**Continued.**

NORFOLK, VA.

[Latitude, 36° 51′ N.; longitude, 76° 17′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Mean. Maximum.	Mean. Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J.....	30.143	30.72	29.66	34.9	42.1	37.2	38.1	73	16	47.3	30.3	31	33	31	32	87	71	79	79	4.42	1.31
F....	30.028	30.57	29.48	38.1	46.7	41.0	41.9	69	17	52.0	33.8	35	39	36	37	88	75	84	82	2.41	1.07
M...	30.024	30.41	29.34	39.8	48.9	43.0	43.9	77	14	56.6	34.6	34	39	37	37	81	72	80	78	4.55	1.20
A...	30.081	30.56	29.57	50.2	63.3	52.8	55.4	93	32	66.4	44.3	44	45	44	44	79	54	73	69	0.97	0.53
M..	29.919	30.21	29.67	61.3	70.8	62.7	64.9	99	44	74.5	57.5	57	60	58	58	88	72	86	82	8.46	3.78
J. ...	29.900	30.23	29.66	69.9	79.9	70.9	73.6	96	55	83.7	64.9	64	65	66	65	83	62	84	76	5.79	2.21
J. ...	29.976	30.19	29.63	73.5	....	75.1	74.3	94	58	84.5	66.8	65	.....	66	66	75	.....	75	75	5.26	2.52
A....	29.956	30.15	29.54	74.8	....	77.1	76.0	98	56	87.8	69.0	67	.....	68	68	78	.....	74	76	7.81	3.29
S....	29.991	30.27	29.62	68.3	....	69.0	68.6	88	40	76.2	64.2	64	.....	64	64	85	.....	83	84	6.10	0.85
O....	29.970	30.38	29.41	54.5	....	57.2	55.8	76	41	65.1	49.1	48	.....	50	49	81	.....	77	79	3.94	1.13
N ...	30.068	30.54	29.43	51.2	....	52.7	52.0	80	33	60.6	46.4	47	.....	46	46	86	......	79	82	3.71	1.49
D....	30.067	30.56	29.15	37.6	....	43.1	40.4	66	20	50.9	34.4	32	.....	36	34	81	......	78	80	3.22	2.52
Y....	30.010	30.72	29.15	54.5	....	56.8	57.1	98	14	67.1	49.6	49	.....	50	50	83	.....	79	78	56.6	......

NORTHFIELD, VT.

[Latitude, 44° 10′ N.; longitude, 72° 41′ W.]

J.....	29.105	29.77	28.40	3.1	11.7	6.6	7.1	41	–24	18.7	–2.9	–2	2	2	0	80	64	80	75	4.99	1.81
F....	29.082	29.49	28.54	11.0	21.8	15.2	16.0	46	–23	27.1	3.8	5	10	8	8	78	62	75	71	2.73	0.75
M ...	29.034	29.59	28.39	16.8	26.5	21.5	21.6	48	–10	30.1	12.7	10	16	14	13	75	66	74	71	4.81	1.46
A....	29.107	29.57	28.61	30.9	42.0	32.2	35.0	77	8	44.7	26.3	24	24	24	24	75	55	72	67	2.87	0.80
M...	29.047	29.35	28.78	46.9	58.6	49.4	51.6	77	24	62.2	40.9	43	47	44	45	87	68	82	79	3.51	0.68
J.....	28.969	29.28	28.65	59.3	71.9	59.3	63.5	89	35	74.7	51.2	55	57	55	55	86	61	86	78	6.17	1.47
J.....	29.046	29.32	28.39	61.9	....	64.4	63.2	85	41	75.4	50.4	55	.....	59	57	80	.....	83	81	1.30	1.04
A ...	29.010	29.37	28.68	62.1	....	64.0	63.0	85	41	73.2	54.0	58	.....	60	59	84	.....	86	85	3.43	1.00
S.....	29.128	29.69	28.62	51.1	....	53.1	52.1	75	25	63.3	45.0	47	.....	49	48	87	.....	87	87	6.27	2.37
O ...	28.975	29.50	28.48	37.0	....	39.0	38.0	62	22	46.1	32.0	34	.....	34	34	88	.....	85	87	3.53	0.83
N ...	29.142	29.79	28.49	33.8	....	34.8	34.3	70	–1	41.8	26.3	28	.....	30	29	82	.....	84	83	3.82	1.00
D ...	28.972	29.51	28.07	24.1	....	26.3	25.2	52	–8	32.9	18.0	20	.....	21	20	84	.....	81	82	2.46	1.10
Y ...	29.051	29.79	28.07	36.5	....	38.8	39.2	89	–24	49.2	29.8	32	.....	33	33	82	.....	81	79	45.9	....

NORTH PLATTE, NEBR.

[Latitude, 41° 8′ N.; longitude, 100° 45′ W.]

J.....	27.168	27.61	26.57	4.4	21.7	12.1	12.7	66	–35	26.5	0.5	–2	10	6	5	76	67	76	73	0.09	0.05
F.....	27.040	27.61	26.74	23.7	40.3	30.4	31.5	68	–4	44.7	20.2	18	24	22	21	80	57	72	70	0.42	0.23
M....	27.067	27.48	26.56	17.5	35.1	28.1	26.9	74	–14	40.4	15.9	14	21	21	19	86	63	76	75	1.44	0.55
A....	27.118	27.54	26.60	39.1	63.9	53.2	52.1	89	26	67.9	37.0	33	29	34	32	79	33	53	55	2.36	1.77
M....	26.967	27.24	26.60	46.5	60.6	54.9	54.0	85	32	65.2	44.3	42	41	46	43	86	54	74	71	4.93	0.82
J......	26.939	27.23	26.60	59.9	78.7	69.4	69.3	98	42	81.6	56.6	52	48	55	52	77	36	62	58	2.76	1.64
J.....	27.118	27.32	26.83	66.7	....	80.8	73.8	101	53	88.4	62.6	60	.....	60	60	80	.....	52	66	2.61	0.95
A....	27.132	27.42	26.88	59.3	....	75.1	67.2	98	44	82.4	56.1	55	.....	56	56	87	.....	54	70	0.65	0.40
S.....	27.168	27.45	26.90	49.9	....	69.5	59.7	96	31	79.4	47.8	44	.....	44	44	79	.....	42	60	0.58	0.58
O....	27.062	27.32	26.74	36.0	....	51.9	44.0	80	20	63.3	33.8	29	.....	34	32	77	.....	52	64	1.12	0.90
N....	27.150	27.50	26.79	25.4	....	37.8	31.6	75	9	49.2	23.6	19	.....	24	22	77	.....	60	68	0.08	0.08
D....	27.100	27.55	26.60	20.1	....	33.0	26.6	67	–3	44.9	16.8	11	.....	19	15	70	.....	58	64	0.42	0.22
Y....	27.086	27.61	26.56	37.4	....	49.7	45.8	101	–35	61.2	34.6	31	.....	35	33	80	.....	61	66	17.5	....

OLYMPIA, WASH.

[Latitude, 47° 37′ N.; longitude, 122° 53′ W.]

J	29.994	30.71	29.44	29.4	34.9	33.3	32.5	56	–2	38.6	26.0	26	29	29	28	89	81	85	85	11.38	2.63
F....	30.108	30.52	29.33	39.2	44.5	42.9	42.2	59	29	48.2	37.3	37	40	40	39	94	86	90	90	2.71	0.98
M ...	29.977	30.36	29.53	38.2	47.2	45.7	43.7	65	23	51.5	36.1	35	40	39	38	90	77	79	82	5.96	2.50
A....	30.079	30.32	29.64	42.4	55.0	53.7	50.4	79	31	61.1	40.6	40	44	44	43	90	67	72	76	1.72	0.34
M ...	29.936	30.20	29.63	44.4	63.1	64.8	57.4	88	34	71.1	43.0	41	46	45	44	87	55	52	64	0.21	0.11
J	29.844	30.20	29.39	51.8	64.8	64.2	60.3	82	42	69.9	50.4	50	52	52	51	95	65	65	75	4.80	0.72
J	30.024	30.34	29.80	50.5	....	71.8	61.2	92	40	75.4	49.2	48	.....	52	50	92	.....	52	72	1.36	0.56
A....	29.986	30.23	29.77	52.3	....	74.9	63.6	86	44	77.1	50.6	51	.....	56	54	95	..,	54	74	0.30	0.21
S.....	29.991	30.38	29.66	51.2	....	70.3	60.8	83	41	71.9	49.4	50	.....	53	51	93	.....	56	74	1.67	1.03
O....	29.986	30.36	29.62	49.6	....	56.7	53.2	74	35	60.4	47.1	48	.....	50	49	95	.....	79	87	4.27	0.73
N ...	30.022	30.33	29.66	40.6	....	46.7	43.6	55	24	49.3	38.0	38	.....	42	40	91	.....	83	87	6.05	1.45
D ...	29.940	30.47	29.41	39.2	....	45.5	42.4	57	20	48.3	37.0	38	.....	41	39	94	.....	84	89	5.11	1.60
Y ...	29.991	30.71	29.33	44.1	....	55.9	50.9	92	–2	60.2	42.1	42	.....	45	44	92	.....	71	80	45.5	....

***Monthly and yearly meteorological summaries*—Continued.**

NORFOLK, VA.

[*H*=69. *T*=87. *h*=79.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.0	6.0	5.1	5.7	5,977	29	SW.	E.	12	15	18	6	12	13	3	14	0	7	14	10	0	14	2	18	0	0	0	J.
5.8	5.4	4.7	5.3	6,015	37	W.	N.	19	9	8	14	13	8	5	11	0	6	17	6	0	16	0	13	0	1	0	F.
3.6	5.4	4.2	4.4	7,929	55	NW.	SE.	16	16	5	20	10	4	9	13	0	14	9	8	0	11	0	12	0	1	0	M.
3.2	3.9	2.2	3.1	5,002	32	NW.	NE.†	14	14	13	12	13	8	6	7	3	18	8	4	0	8	0	0	1	1	0	A.
5.5	6.5	4.0	5.3	6,705	30	W.	S.	12	15	17	9	29	6	3	2	0	7	15	9	0	17	0	0	0	6	0	M.
4.0	5.2	3.1	4.1	5,521	36	SW.	NE.	8	27	9	6	17	16	3	3	1	10	17	3	0	11	0	0	8	10	0	J.
3.3	.....	4.7	4.0	4,846	36	NW.	NE.	8	17	12	10	7	5	1	1	1	12	15	4	0	12	0	0	6	9	0	J.
4.2	....	3.7	4.0	4,261	38	S.	SE.	4	3	5	15	14	10	2	1	8	9	18	4	0	13	0	0	12	9	0	A.
6.6	.....	5.2	5.9	6,405	30	SE.	NE.	3	20	7	11	8	7	1	3	0	7	10	13	0	22	0	0	0	1	0	S.
4.4	.....	4.3	4.4	6,391	36	SW.†	SE.	7	8	3	15	9	10	3	5	2	12	10	9	0	16	0	0	0	2	0	O.
5.9	.....	6.4	6.2	7,208	50	NW.	NE.	3	16	11	8	10	7	2	2	1	5	9	16	0	11	0	0	0	0	0	N.
4.5	.....	3.5	4.0	6,915	48	SW.	NW.	6	3	1	10	12	11	3	14	2	16	7	8	0	8	0	10	0	0	0	D.
4.8	.....	4.3	4.7	73,175	.....	....	NE.	112	163	109	136	154	165	41	76	18	123	149	94	0	159	2	53	27	40	0	Y.

NORTHFIELD, VT.

[*H*=871.• *T*=16. *h*=2.3.]

6.3	5.2	3.8	5.1	8,238	51	N.	N.	26	20	5	1	18	10	5	6	2	10	12	9	0	17	25	31	0	0	2	J.
6.9	5.6	4.8	5.8	6,371	48	S.	S.	26	8	1	1	30	13	4	4	0	6	13	10	0	14	20	29	0	0	2	F.
6.8	7.1	5.7	6.5	8,573	40	N.	N.	33	8	1	1	26	4	10	9	1	5	16	10	0	14	17	30	0	0	1	M.
5.7	5.3	4.7	5.2	6,315	42	SW.	S.	18	11	0	1	30	10	10	9	1	10	12	8	0	15	1	24	0	0	3	A.
6.9	6.9	6.4	6.7	6,424	30	S.†	S.	15	9	1	3	41	15	4	5	0	2	13	16	0	15	0	3	0	0	1	M.
4.9	4.9	3.7	4.5	5,580	30	W.†	S.	7	5	3	2	35	14	8	12	4	9	17	4	0	14	0	0	0	5	0	J.
3.3	.....	3.3	3.3	6.059	38	SW.	SW.†	9	2	1	0	13	13	8	12	4	15	10	6	0	8	0	0	0	5	0	J.
7.2	.....	5.4	6.3	6,033	33	NW.	S.	8	7	1	2	30	9	1	3	1	5	9	17	0	13	0	0	0	2	0	A.
6.7	.....	4.6	5.6	5,228	36	N.	S.	12	8	0	1	23	4	1	2	9	4	12	14	0	14	0	2	0	1	0	S.
8.0	.....	7.5	7.8	6,497	42	N.	S.	19	6	0	1	20	3	2	6	5	3	3	25	0	17	0	15	0	0	0	O.
7.0	.....	7.1	7.0	6,945	36	N.†	S.	16	5	0	2	22	3	4	2	6	2	7	21	0	16	6	17	0	0	0	N.
8.0	.....	8.1	8.0	7,762	48	N.	S.	18	5	1	0	21	9	1	4	3	1	8	22	0	15	13	25	0	0	0	D.
6.5	.....	5.4	6.0	80,025	...	....	S.	207	94	14	15	309	107	58	74	36	72	132	162	0	172	82	176	0	13	9	Y.

NORTH PLATTE, NEBR.

[*H*=2,841. *T*=45. *h*=34.]

2.0	3.4	2.6	2.7	5,556	46	NW.	NW.	12	4	5	14	9	4	21	23	1	19	11	1	0	3	19	31	0	0	0	J.
4.9	5.0	3.2	4.4	6,263	48	NW.	NW.	13	6	7	10	9	9	12	19	2	10	15	4	0	5	5	26	0	0	0	F.
4.8	5.3	3.8	4.7	7,518	39	N.	N.	18	4	11	15	10	7	11	14	3	11	11	9	0	10	10	29	0	0	0	M.
4.9	5.0	3.0	4.3	8,526	48	N.	SE.	17	6	6	25	9	9	8	9	1	10	17	3	0	6	0	10	0	2	0	A.
5.7	6.5	5.6	6.0	8,936	54	N.	N.	19	10	8	17	6	2	5	18	8	7	13	11	0	16	0	1	0	3	0	M.
4.8	3.4	3.3	3.8	9,028	48	S.	SE.	4	2	7	31	14	6	11	11	4	12	16	2	0	5	0	0	4	3	0	J.
3.7	.....	4.0	3.8	6,539	40	NW.	E.	2	5	19	15	7	3	4	5	2	17	9	5	0	8	0	0	12	6	0	J.
3.6	.. ..	4.7	4.2	6,167	35	N.	N.	14	4	9	13	9	5	2	6	0	3	22	6	0	6	0	0	4	5	0	A.
2.4	.....	2.5	2.4	6,283	37	S.	SE.	6	6	5	19	4	3	9	8	0	14	16	0	0	2	0	2	2	3	0	S.
3.6	.....	4.0	3.8	5,750	32	NW.	W.	7	4	8	10	3	4	14	12	0	7	19	5	0	4	0	11	0	0	0	O.
4.1	.....	3.7	3.9	5,705	28	SE.	SE.	6	2	4	15	12	3	7	11	0	10	13	7	0	1	1	24	0	0	0	N.
2.6	.....	2.4	2.5	5,597	36	NW.	W.	5	3	2	9	4	8	21	10	0	15	9	7	0	3	6	31	0	0	0	D.
3.9	.....	3.6	3.9	81,868	.....	....	SE.	123	56	91	193	96	63	125	146	21	135	171	60	0	69	41	165	22	22	0	Y.

OLYMPIA, WASH.

[*H*=36. *T*=46.1. *h*=40.6.]

5.6	7.2	5.6	6.2	3,008	30	NE.	S.	10	6	1	1	25	5	3	1	41	7	11	13	0	20	8	20	0	0	0	J.
7.9	9.0	6.9	7.9	2,094	24	SW.	S.	14	8	1	4	22	9	3	0	26	4	6	19	0	12	0	3	0	0	0	F.
6.6	7.2	7.4	7.0	3,061	18	S.	S.	19	8	6	12	27	9	6	2	4	5	9	17	0	16	0	6	0	0	0	M.
5.5	6.4	5.4	5.7	2,727	24	SW.	S.	12	4	2	2	26	12	13	9	10	8	10	12	0	13	0	1	0	0	0	A.
3.5	2.4	2.0	2.7	2,516	18	NE.	N.	22	9	0	2	12	8	14	2	24	19	8	4	0	4	0	0	0	1	0	M.
7.8	7.5	6.7	7.3	2,286	18	S.†	S.	9	4	1	1	23	11	14	3	24	3	9	18	0	20	0	0	0	1	0	J.
3.6	.....	3.6	3.6	2,764	14	W.†	S.	11	6	0	5	12	9	9	4	6	13	7	11	0	6	0	0	1	0	0	J.
4.5	.....	3.3	3.9	2,289	12	N.†	N.	18	4	3	1	13	2	9	8	4	15	10	6	0	4	0	0	0	0	0	A.
4.0	.....	2.8	3.4	2,188	12	NE.†	S.	6	5	6	7	11	6	5	8	6	15	8	7	0	8	0	0	0	0	0	S.
7.5	.....	7.6	7.6	2,807	17	W.	S.	5	1	1	1	24	11	4	5	10	3	9	19	0	19	0	0	0	0	0	O.
7.3	.....	7.9	7.6	2,889	20	S.	S.	3	4	2	7	31	4	1	1	7	4	5	21	0	18	0	6	0	0	0	N.
6.9	.....	6.9	6.9	2,306	16	S.	S.	7	3	2	1	33	1	3	2	10	6	7	18	0	16	0	8	0	0	0	D.
5.9	.....	5.5	5.8	30,935	.....	....	S.	136	62	25	41	259	87	84	45	172	102	99	165	0	156	8	44	1	2	0	Y.

Monthly and yearly meteorological summaries—Continued.

OMAHA, NEBR.

[Latitude, 41° 16′ N.; longitude, 95° 56′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	Maximum.	Minimum.	Mean. Maximum.	Mean. Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	7 a.m.	3 p.m.	10 p.m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J ...	29.068	29.63	28.31	3.4	11.9	8.8	8.0	51	-25	17.3	-1.0	-1	3	1	1	81	68	70	73	0.58	0.34
F ...	28.899	29.65	28.44	20.6	31.2	25.9	25.9	62	-17	36.3	17.3	14	20	17	17	76	65	70	70	0.74	0.59
M...	28.913	29.43	28.29	22.9	34.1	29.5	28.8	78	- 4	39.4	20.3	17	24	22	21	79	69	74	74	3.25	1.05
A ...	28.934	29.42	28.36	44.2	60.2	53.1	52.5	86	28	65.7	42.1	35	35	38	36	71	44	60	58	2.95	1.55
M...	28.742	29.05	28.31	49.5	61.2	57.0	55.9	84	37	66.9	47.9	44	44	45	44	82	57	67	68	4.86	0.94
J.....	28.735	29.08	28.38	63.1	76.4	70.4	70.0	96	46	80.0	60.6	57	56	58	57	80	52	66	66	3.86	1.68
J.....	28.855	29.06	28.69	72.5	....	82.7	77.6	101	60	89.8	68.5	66	.....	68	67	81	.....	62	72	2.56	1.26
A ...	28.868	29.16	28.62	65.1	....	75.5	70.3	99	53	81.7	63.1	61	.....	65	63	86	.....	71	79	3.44	1.50
S.....	28.922	29.27	28.62	55.0	....	67.6	61.3	95	39	74.8	53.2	49	.....	52	51	81	.....	59	70	0.24	0.09
O ...	28.836	29.09	28.48	42.3	....	54.4	48.4	80	28	61.9	40.6	36	.....	38	37	78	.....	57	68	1.16	0.44
N ...	28.976	29.42	28.57	32.5	....	40.9	36.7	78	17	48.8	30.6	26	.....	28	27	77	.....	63	70	0.12	0.06
D ...	28.916	29.31	28.38	26.6	....	34.3	30.4	66	10	40.8	23.8	21	.....	25	23	79	.....	70	74	0.96	0.36
Y ...	28.889	29.65	28.29	41.5	....	50.0	47.2	101	-25	58.6	38.9	35	.....	38	37	79	.....	66	70	24.20	....

OSWEGO, N. Y.

[Latitude, 43° 29′ N.; longitude, 76° 35′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	Maximum.	Minimum.	Mean. Maximum.	Mean. Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	7 a.m.	3 p.m.	10 p.m.	Mean.	Total.	Max. 24 hours.
J.....	29.776	30.42	29.19	13.5	17.3	15.5	15.4	48	-8	23.3	7.5	10	12	11	11	86	80	84	83	2.01	0.78
F.....	29.691	30.31	29.11	19.9	24.9	22.0	22.3	48	-10	29.6	14.0	16	18	17	17	84	76	80	80	1.62	0.78
M.....	29.695	30.14	29.08	20.9	25.5	21.3	23.6	50	-1	31.0	16.7	16	19	20	18	84	78	83	81	1.79	0.51
A ...	29.727	30.16	29.14	35.7	40.7	37.9	38.1	72	19	44.0	32.1	28	29	31	29	76	64	77	72	2.09	0.67
M...	29.606	29.96	29.24	50.2	54.5	51.4	52.0	77	32	60.0	44.6	43	44	44	44	77	70	77	74	1.56	0.54
J.....	29.550	29.84	29.25	61.4	67.5	62.3	63.7	88	41	72.7	53.9	54	54	53	54	79	63	74	72	2.60	0.86
J.....	29.635	29.84	29.15	64.4	....	66.3	65.4	89	48	74.3	57.3	56	.....	54	55	74	.....	66	70	2.32	0.78
A ...	29.602	29.93	29.26	64.5	....	68.2	66.4	87	50	74.0	59.8	56	.....	57	57	76	.....	68	72	4.56	2.55
S.....	29.696	30.18	29.22	56.1	....	59.2	57.6	78	36	64.6	50.9	49	.....	50	50	79	.....	73	76	5.27	2.27
O.....	29.576	29.97	29.00	42.3	....	45.6	44.0	70	30	50.2	38.0	36	.....	36	36	78	.....	72	75	3.24	0.68
N ...	29.750	30.33	29.16	38.3	....	39.6	39.0	69	9	45.5	33.4	32	.....	32	32	78	.....	76	77	3.52	0.93
D ...	29.641	30.20	29.03	28.0	....	30.6	29.3	51	-3	35.5	23.6	22	.....	23	23	80	.....	76	78	2.21	0.80
Y ...	29.662	30.42	29.00	41.3	....	43.6	43.1	89	-10	50.4	36.0	35	.....	36	35	79	.....	75	76	32.8	....

PALESTINE, TEX.

[Latitude, 31° 45′ N.; longitude, 92° 40′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	Maximum.	Minimum.	Mean. Maximum.	Mean. Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	7 a.m.	3 p.m.	10 p.m.	Mean.	Total.	Max. 24 hours.
J	29.719	30.17	29.36	37.8	48.8	43.7	43.4	78	4	53.5	34.0	34	38	37	36	88	69	79	79	4.50	1.60
F ...	29.519	29.99	29.22	47.2	56.8	52.9	52.3	75	33	60.3	44.8	42	43	44	43	84	64	75	74	4.74	1.41
M ...	29.555	30.01	29.00	47.2	58.8	54.0	53.3	79	29	63.5	44.1	43	44	44	44	85	60	72	72	9.48	4.72
A....	29.548	29.77	29.32	62.7	74.1	68.6	68.5	84	42	77.7	61.3	59	58	60	59	88	60	76	75	6.62	4.59
M ...	29.382	29.55	29.18	64.6	75.9	70.8	70.4	88	49	80.0	61.9	61	62	63	62	90	64	78	77	6.64	1.46
J	29.398	29.60	29.23	72.3	84.1	76.8	77.7	94	64	87.2	70.8	69	70	70	70	89	65	81	78	5.80	1.81
J	29.504	29.64	29.36	75.8	....	83.7	79.8	94	64	89.8	72.1	71	.....	73	72	86	.....	72	79	4.39	3.16
A....	29.450	29.66	29.27	75.8	....	82.8	79.3	95	65	89.5	71.9	72	.....	74	73	87	.....	75	81	3.21	1.28
S	29.512	29.82	29.40	67.0	....	76.7	71.8	90	52	84.4	62.9	62	.....	68	65	84	.....	75	80	0.27	0.20
O ...	29.506	29.77	29.31	60.1	....	70.7	65.4	90	37	79.8	56.2	56	.....	63	60	88	.....	77	82	1.51	0.66
N....	29.588	29.85	29.13	50.0	....	56.4	53.2	87	32	64.3	46.6	46	.....	51	48	87	.....	83	85	5.92	1.88
D....	29.616	29.91	29.17	41.7	....	54.9	49.8	72	29	61.5	41.8	41	.....	49	45	89	.....	81	85	6.58	1.40
Y....	29.525	30.17	29.00	58.8	....	66.0	63.7	95	4	74.3	55.7	55	.....	58	56	87	.....	77	79	59.7	....

PARKERSBURGH, W. VA.

[Latitude, 39° 16′ N.; longitude, 81° 36′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	Maximum.	Minimum.	Mean. Maximum.	Mean. Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	7 a.m.	3 p.m.	10 p.m.	Mean.	Total.	Max. 24 hours.
J	....	....	....	....	....	....	....	......	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
F	....	....	....	....	....	....	....	......	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
M	....	....	....	....	....	....	....	......	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
A	....	....	....	....	....	....	....	......	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
M	....	....	....	....	....	....	....	......	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
J	....	....	....	....	....	....	....	......	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
J	29.380	29.49	29.06	69.1	75.0	....	72.0	92	52	84.0	62.2	62	64	.....	63	80	69	.....	75	10.33	3.10
A ...	29.376	29.63	29.03	67.3	73.1	....	70.2	96	47	82.2	61.9	62	64	.....	63	83	74	.....	79	6.71	2.66
S	29.404	29.64	29.09	56.8	62.3	....	59.6	83	33	71.1	52.7	53	55	.....	54	86	79	.....	82	5.19	1.76
O ...	29.336	29.66	28.85	45.2	49.9	....	47.6	74	28	57.6	40.5	40	42	.....	41	82	76	.....	79	4.95	.87
N ...	29.479	29.81	29.04	41.1	45.2	....	43.2	76	24	53.0	37.5	34	37	.....	36	78	74	.....	76	4.13	.90
D ...	29.461	29.88	28.89	30.8	36.1	....	33.4	63	12	42.9	28.5	24	28	.....	26	77	74	.....	76	1.62	.66
Y....	....	....	....	....	....	....	....	......	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....

Monthly and yearly meteorological summaries—Continued.

OMAHA, NEBR.

[*H*=1,113. *T*=88. *h*=82.]

Cloudiness (in tenths).				Wind.													Number of days.										
7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
3.7	4.3	2.6	3.5	6,087	42	NW.	NW.	16	1	1	12	16	6	4	30	7	16	10	5	0	4	23	30	0	0	0	J.
2.9	5.2	3.3	3.8	5,773	42	N.	S.	21	2	1	6	24	3	2	18	10	14	12	3	1	5	11	24	0	0	0	F.
5.7	6.2	4.9	5.6	7,485	36	N.	N.	25	5	7	11	10	5	2	19	9	9	12	10	0	10	9	28	0	1	0	M.
5.4	6.8	4.2	5.1	7,465	36	N.	N.	23	5	1	19	18	5	2	11	6	8	13	9	0	8	0	2	0	2	0	A.
7.4	6.8	5.2	6.4	6,629	29	NW.	NW.	13	7	7	15	11	3	1	29	7	5	11	15	0	16	0	0	0	7	0	M.
6.5	5.5	3.8	5.3	6,177	47	S.	S.	4	4	2	25	28	6	3	14	4	4	21	5	0	9	0	0	2	6	0	J.
4.9	.....	3.5	4.2	5,213	37	NW.	S.	8	5	3	12	22	4	3	4	1	10	11	10	0	10	0	0	15	5	0	J.
4.7	.....	4.6	4.6	5,095	34	NW.	S.	16	5	1	15	18	0	1	4	2	12	8	11	0	10	0	0	4	7	0	A.
4.5	.....	2.9	3.7	5,235	26	SW.	NW.	11	4	4	9	8	2	1	15	6	12	7	11	0	5	0	0	1	0	0	S.
5.4	.....	2.7	4.0	5,110	28	NW.	N.	14	1	0	8	11	4	4	10	10	11	7	13	0	3	0	2	0	0	0	O.
4.2	.....	4.5	4.4	6,220	34	N.	S.	13	1	0	7	22	1	2	11	3	13	7	10	0	2	3	20	0	1	0	N.
4.8	.....	2.7	3.8	6,994	32	NW.	NW.	9	1	0	4	18	3	4	21	2	14	5	12	0	8	8	27	0	0	0	D.
5.0	.....	3.7	4.5	73,483	.....	....	S.	173	41	27	143	206	42	29	186	67	128	124	114	1	90	54	133	22	29	0	Y.

OSWEGO, N. Y.

[*H*=335. *T*=76. *h*=83.]

Cloudiness (in tenths).				Wind.													Number of days.										
7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
9.8	8.1	7.8	8.5	10,912	42	NW.	SE.	7	6	3	28	12	2	10	25	0	0	9	22	0	22	26	31	0	0	0	J.
9.2	7.8	6.7	7.9	8,706	39	SE.	SE.	8	2	1	25	14	4	13	18	2	1	10	18	0	12	15	28	0	0	0	F.
8.0	8.0	7.4	7.8	10,395	39	N.	W.	4	4	1	19	11	1	30	23	0	2	7	20	0	15	16	27	0	0	0	M.
5.2	4.4	4.8	4.8	7,870	36	SE.†	W.	13	4	1	19	2	2	28	20	1	11	11	8	0	13	0	16	0	3	2	A.
7.9	5.5	5.5	6.3	6,988	26	SE.	SE.	14	0	4	30	9	7	24	5	0	2	16	13	0	18	0	0	0	4	3	M.
6.5	4.2	2.9	4.5	5,953	31	S.	W.	9	0	3	10	18	13	29	7	1	6	19	5	0	11	0	0	0	5	0	J.
4.1	.....	4.7	4.4	6,037	38	N.	W.	6	0	1	7	14	4	19	4	7	9	15	7	0	5	0	0	0	3	2	J.
6.1	.....	4.9	5.5	6,732	48	N.	S.	5	1	1	3	17	15	11	7	2	12	8	11	0	9	0	0	0	4	0	A.
6.3	.....	4.6	5.4	6,318	30	N.	S.	5	3	2	13	18	4	3	10	2	8	13	9	0	10	0	0	0	2	0	S.
8.4	.....	7.5	7.9	9,062	32	SE.†	NW.	8	3	1	15	12	3	2	17	1	2	6	23	0	19	0	4	0	1	0	O.
8.8	.....	6.7	7.8	9,145	36	N.†	S.	6	7	0	10	15	6	7	9	0	1	10	19	0	16	5	12	0	0	0	N.
8.8	.....	9.0	8.9	10,160	36	NW.†	S.	5	4	0	1	24	8	5	15	0	1	6	24	0	17	8	25	0	0	0	D.
7.4	.....	6.0	6.6	98,278	.....	....	W.†	90	34	18	180	166	69	181	160	16	55	132	179	0	167	70	143	0	22	7	Y.

PALESTINE, TEX.

[*H*=511. *T*=42. *h*=38.]

Cloudiness (in tenths).				Wind.													Number of days.										
7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
7.1	7.3	6.7	7.1	7,221	38	S.	S.	19	19	1	3	32	4	3	12	0	6	6	19	0	17	4	16	0	1	0	J.
5.4	7.1	5.5	6.0	6,890	32	S.	NE.	10	23	2	1	21	8	8	14	0	8	10	11	0	11	0	0	0	2	0	F.
5.4	6.6	5.1	5.7	7,915	33	W.	S.	17	11	1	7	29	9	3	16	0	8	11	12	0	10	0	2	0	4	0	M.
6.4	6.9	3.6	5.6	7,190	30	SE.	S.	12	15	3	16	37	4	2	1	0	6	15	9	0	8	0	0	0	3	0	A.
5.0	5.6	3.9	4.9	6,472	48	NW.	S.	10	11	5	9	45	5	4	3	1	9	14	8	0	12	0	0	0	8	0	M.
6.1	6.9	2.7	5.3	5,915	34	SE.	S.	1	10	14	17	42	5	0	1	0	6	17	7	0	12	0	0	3	3	0	J.
3.1	....	3.0	3.0	4,871	26	NE.	S.	4	8	4	6	26	10	3	1	0	16	9	6	0	8	0	0	17	1	0	J.
4.6	.....	3.9	4.2	5,564	30	SE.	S.	3	11	10	10	16	4	2	6	0	12	14	5	0	10	0	0	18	2	0	A.
2.5	.....	3.3	2.9	5,028	22	S.†	NE.	18	30	3	1	7	0	1	0	0	21	4	5	0	4	0	0	2	0	0	S.
6.1	.....	2.5	4.3	4,147	22	S.	S.†	14	6	6	5	14	9	1	3	4	16	8	7	0	6	0	0	2	0	0	O.
7.4	.....	5.3	6.4	3,953	22	W.	NE.	9	18	6	3	4	5	8	5	2	6	9	15	0	14	0	0	0	1	0	N.
5.3	.....	4.0	4.6	4,712	27	W.	SE.	6	4	8	13	5	6	9	10	1	14	7	10	0	14	0	2	0	1	0	D.
5.4	.....	4.1	5.0	69,878	.....	....	S.	123	166	63	91	278	69	44	72	8	128	124	114	0	126	4	20	42	26	0	Y.

PARKERSBURGH, W. VA.

[*H*=638. *T*=76. *h*=67.]

Cloudiness (in tenths).				Wind.													Number of days.										
7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	J.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	F.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	M.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	A.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	M.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	J.
4.6	4.2	.....	4.4	2,764	36	E.	NW.	2	3	3	7	8	11	9	13	6	17	2	12	0	12	0	0	1	9	0	J.
4.7	4.6	.....	4.6	2,719	42	W.	NW.	1	3	4	8	13	9	3	14	7	12	10	9	0	11	0	0	5	7	0	A.
4.5	3.7	.....	4.1	2,589	24	SW.	NW.†	2	6	1	9	11	4	6	11	10	14	10	6	0	11	0	0	0	2	0	S.
5.1	5.6	.....	5.4	3,964	36	SW.	SE.	2	3	0	17	7	10	13	5	5	12	6	13	0	16	0	2	0	3	0	O.
6.4	5.2	.....	5.8	3,793	30	SW.	NW.†	0	6	3	13	6	9	6	13	4	11	5	14	0	16	0	10	0	0	0	N.
5.2	5.8	.....	5.5	4,314	38	W.	W.†	2	0	2	13	15	9	15	5	1	12	7	12	0	9	5	20	0	0	0	D.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	Y.

Monthly and yearly meteorological summaries—Continued.

PENSACOLA, FLA.

[Latitude, 30° 25′ N.; longitude, 87° 13′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
	In.	*In.*	*In.*	°	°	°	°	°	°	°	°	°	°	°	°					*In.*	*In.*
J....	30.179	30.43	29.74	50.9	60.6	55.8	55.8	71	26	63.1	48.9	46	51	50	49	85	73	83	80	4.14	2.18
F ...	30.004	30.41	29.69	54.8	63.2	58.6	58.9	70	32	64.7	53.0	50	55	53	53	86	76	83	82	6.86	2.61
M ...	30.055	30.39	29.68	54.4	64.3	59.7	59.5	76	38	66.3	52.8	48	50	52	50	79	63	76	73	8.90	4.11
A ...	30.100	30.33	29.90	65.0	74.6	70.2	69.9	78	54	75.0	61.8	60	62	61	61	82	67	75	75	1.60	1.03
M ...	29.914	30.09	29.71	69.6	77.3	73.1	73.3	85	58	78.3	66.8	64	66	65	65	83	69	77	76	4.81	1.78
J.....	29.939	30.20	29.75	75.4	81.5	78.3	78.4	88	64	84.0	72.9	70	70	71	70	82	70	78	77	7.42	4.67
J.....	29.982	30.10	29.89	81.0	....	83.1	82.0	94	72	88.7	75.7	74	.....	73	74	80	.....	73	76	2.20	0.94
A ...	29.968	30.13	29.82	78.7	....	81.3	80.0	91	70	86.0	73.8	74	.....	74	74	84	.....	78	81	9.58	2.86
S....	29.944	30.25	29.82	72.7	....	76.6	74.6	89	54	83.1	69.3	67	.....	70	68	83	.....	81	82	4.78	1.60
O ...	29.980	30.22	29.68	64.6	....	69.7	67.2	83	51	76.3	61.8	59	.....	63	61	81	.....	79	80	2.49	1.16
N ...	30.044	30.26	29.72	55.9	....	60.6	58.2	81	31	66.9	52.9	51	.....	54	52	85	.....	79	82	4.71	1.76
D ...	30.116	30.40	29.64	46.9	....	54.0	50.4	68	28	59.9	44.7	42	.....	46	44	83	.....	74	78	4.42	2.18
Y ...	30.019	30.43	29.64	64.2	....	68.4	67.4	94	26	74.4	61.2	59	.....	61	60	83	.....	78	78	61.9	....

PHILADELPHIA, PA.

[Latitude, 39° 57′ N.; longitude, 75° 9′ W.]

J....	30.072	30.70	29.49	25.8	30.7	27.4	28.0	56	2	35.4	20.2	18	20	20	19	74	65	75	71	4.30	1.58
F.....	29.986	30.55	29.37	30.8	37.9	33.6	34.1	58	2	41.7	26.1	23	25	25	24	75	63	73	70	2.57	0.76
M ...	29.951	30.44	29.24	30.5	40.4	34.5	35.1	70	8	43.4	27.0	23	26	25	24	74	58	69	67	5.42	2.47
A.....	30.006	30.47	29.45	44.7	57.9	49.6	50.7	91	31	60.3	41.8	32	33	33	33	63	41	55	53	2.10	0.64
M ...	29.886	30.18	29.59	56.6	66.5	58.8	60.6	87	42	69.0	53.5	49	51	50	50	76	60	75	70	3.46	0.71
J	29.829	30.13	29.60	67.6	79.9	70.3	72.6	97	52	83.5	63.2	58	58	59	58	72	49	68	63	1.09	0.78
J	29.912	30.14	29.54	69.8	....	74.4	72.1	94	57	83.1	64.7	58	.....	61	60	69	.....	64	66	3.38	1.69
A. ..	29.891	30.18	29.30	71.7	....	75.6	73.6	98	54	84.9	66.7	62	.....	63	63	73	.. ..	67	70	5.86	2.07
S....	29 959	30.44	29.52	62.3	....	64.8	63.6	82	40	73.1	58.5	57	.....	56	57	82	.....	76	79	5.73	1.48
O ...	29.876	30.29	29.37	48.2	....	52.5	50.4	70	35	58.9	44.4	40	.....	42	41	76	.....	68	72	3.23	1.03
N	30.026	30.63	29.20	44.1	....	47.4	45.8	75	18	54.3	40.4	38	.....	38	38	82	.....	71	76	3.77	1.41
D....	29.963	30.51	28.91	34.0	....	37.5	35.8	61	12	43.8	30.4	26	.....	26	26	74	.....	64	69	3.15	2.23
Y....	29.946	30.70	28.91	48.8	....	52.2	51.9	98	2	61.0	44.7	41	.....	42	41	74	.....	69	69	44.1	....

PITTSBURGH, PA.

[Latitude, 40° 32′ N.; longitude, 80° 2′ W.]

J	29.263	29.86	28.72	26.5	31.3	28.1	28.6	61	3	36.0	20.3	19	22	21	21	75	69	75	73	6.17	1.21
F.....	29.147	29.86	28.53	29.3	38.8	34.3	34.1	61	1	43.5	25.7	23	27	26	25	77	63	73	71	1.74	0.63
M ...	29.172	29.54	28.30	31.9	40.3	36.7	36.3	72	9	46.4	27.5	25	29	28	27	76	66	72	71	2.51	0.55
A ...	29.223	29.65	28.68	42.9	58.3	50.3	50.5	86	26	61.6	38.9	35	36	36	36	75	47	61	61	1.04	0.25
M ...	29.058	29.40	28.78	56.1	67.2	60.8	61.4	85	37	71.2	52.5	48	51	50	50	76	58	69	68	4.13	1.01
J	29.066	29.35	28.86	65.3	79.0	71.2	71.8	95	41	82.4	61.4	57	57	58	57	76	50	65	64	2.22	1.11
J	29.146	29.31	28.90	68.6	....	74.9	71.8	90	50	82.4	62.4	59	.....	59	59	73	.....	60	66	4.36	1.10
A ...	29.138	29.40	28.78	67.6	....	73.7	70.6	93	48	81.0	62.9	60	.....	62	61	76	.....	68	72	7.26	3.65
S. ..	29.182	29.48	28.81	57.1	.. ..	63.2	60.2	81	39	69.6	53.6	51	.....	53	52	81	.....	70	76	1.77	0.96
O.....	29.086	29.43	28.60	46.6	. ...	51.4	49.0	74	33	57.1	42.5	40	.....	40	40	78	.....	68	73	3.46	0.69
N....	29.232	29.60	28.77	42.4	... .	46.2	44.3	74	24	52.3	38.3	35	.....	36	36	77	.....	70	74	3.57	0.66
D....	29.178	29.61	28.53	33.1	....	37.0	35.0	62	12	42.0	29.6	26	.....	26	26	75	.....	68	72	1.66	0.58
Y....	29.158	29.86	28.30	47.3	....	52.3	51.1	95	1	60.5	43.0	40	.....	41	41	76	.....	68	70	39.9	....

POPLAR RIVER, MONTANA.

[Latitude. 48° 8′ N.; longitude, 105° 10′ W.]

J....	27.971	28.43	27.37	-19.5	- 2.2	- 8.4	-10.0	44	-57	4.3	-23.3	-24	- 8	-14	-15	81	78	78	80	0.48	0.35
F ...	27.866	28.42	27.35	1.9	16.1	10.2	9.4	42	-31	23.0	- 2.8	- 3	11	5	4	80	81	80	81	0.60	0.25
M...	27.923	28.37	27.38	1.2	16.3	10.9	9.5	46	-35	22.0	- 2.9	- 4	11	6	4	80	79	83	81	0.41	0.11
A....	27.890	28.58	27.31	28.9	46.8	40.0	38.6	84	- 4	52.8	26.5	23	32	31	29	80	60	72	71	0.78	0.26
M ...	27.834	28.27	27.40	38.6	59.5	51.8	50.0	79	23	63.7	37.5	31	38	38	36	75	48	63	62	0.77	0.42
J	27.659	28.04	27.17	52.2	70.9	62.8	62.0	101	32	75.2	50.5	44	52	52	49	76	57	71	68	4.94	1.86
J	27.885	28.10	27.59	58.0	....	75.8	66.9	97	45	82.4	53.9	49	.....	58	53	74	.....	55	64	2.19	0.50
A....	27.902	28.14	27.66	55.0	....	73.3	64.2	97	37	78.9	50.5	50	.....	54	52	84	.....	52	68	1.40	0.48
S.....	27.918	28.26	27.56	45.8	....	67.0	56.4	91	29	76.1	43.0	38	.....	42	40	77	.....	42	59	0.61	0.28
O ...	27.808	28.15	27.22	34.2	....	48.4	41.3	77	19	56.9	31.4	29	.....	34	32	82	.....	60	71	0.88	0.44
N....	27.906	28.30	27.48	16.2	....	30.2	23.2	62	- 4	40.6	13.4	12	.....	24	18	84	.....	77	81	0.11	0.10
D....	27.863	28.34	27.38	14.1	....	22.8	18.4	60	-13	33.0	9.3	11	.....	18	14	88	.....	81	85	0.23	0.17
Y....	27.869	28.58	27.17	27.2	....	40.4	35.8	101	-57	50.7	23.9	21	.....	29	26	80	.....	68	72	13.40	....

Monthly and yearly meteorological summaries—**Continued.**

PENSACOLA, FLA.

[*H*=56. *T*=79. *h*=80.]

Cloudiness (in tenths).				Wind.													Number of days—										Months and year.
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	
5.6	6.4	4.2	5.4	4,377	26	N.	N.	24	19	17	13	6	2	3	6	3	6	16	9	0	10	0	1	0	1	0	J.
6.1	6.6	4.7	5.8	4,734	30	NW.	SE.	12	12	8	13	12	9	8	8	5	6	13	10	0	13	0	0	0	4	0	F.
5.4	5.7	3.9	5.0	6,894	42	SE.	N.	20	10	8	17	17	8	5	5	3	11	12	8	0	11	0	0	0	3	0	M.
4.7	4.7	3.7	4.0	6,007	26	SE.†	SW.	10	11	7	11	9	28	9	4	1	13	12	5	0	5	0	0	0	3	0	A.
4.3	5.2	2.7	4.0	5,859	30	SE.	SW.	17	7	2	15	13	19	9	8	3	11	16	4	0	11	0	0	0	5	0	M.
5.7	5.6	3.9	5.1	5,823	48	SW.	SW.	7	4	2	12	5	32	15	12	1	7	17	6	0	9	0	0	0	5	0	J.
3.7	.....	5.2	4.4	5,808	24	NE.†	SW.	6	10	4	5	2	20	3	12	0	14	12	5	0	8	0	0	8	3	0	J.
6.3	.....	7.2	6.8	7,144	60	SW.	NE.†	2	12	4	12	7	8	7	10	0	6	7	18	0	20	0	0	1	4	0	A.
5.2	.....	5.0	5.1	6,015	36	W.	NE.	4	30	6	7	1	8	2	2	0	11	9	10	0	8	0	0	0	2	0	S.
4.2	.....	3.5	3.8	6,560	30	SE.	NE.	8	12	8	9	2	8	6	9	0	18	5	8	0	7	0	0	0	0	0	O.
5.4	.....	3.7	4.6	6,622	36	N.	NE.	10	23	3	8	2	2	4	8	0	13	5	12	0	7	0	0	0	0	0	N.
4.9	.....	3.5	4.2	6,864	36	SE.	N.	19	14	8	8	0	5	2	6	0	16	4	11	0	11	0	2	0	0	0	D.
5.1	.....	4.3	4.9	72,707	.....	....	NE.†	139	164	77	130	76	149	73	90	16	132	128	106	0	120	0	3	9	30	0	Y.

PHILADELPHIA, PA.

[*H*=117. *T*= 168. *h*=166.]

6.6	6.3	5.3	6.1	8,346	36	NW.†	NW.	16	9	6	6	6	5	13	31	1	6	14	11	0	14	11	30	0	0	0	J.
6.1	5.5	4.8	5.5	7,106	36	NW.	NW.	16	13	5	1	8	9	11	24	0	6	16	7	0	12	4	20	0	0	0	F.
6.2	6.2	4.8	5.8	10,586	60	NW.	NW.	9	11	4	6	10	5	6	42	0	9	10	12	0	14	5	20	0	1	0	M.
4.0	4.9	3.4	4.1	7,721	37	NW.	NW.	9	3	7	1	15	11	6	38	0	14	10	6	0	8	0	1	1	1	0	A.
7.7	7.9	7.4	7.7	6,530	36	W.	NW.	5	11	10	13	7	14	10	19	4	2	11	18	0	19	0	0	0	3	0	M.
5.1	5.7	4.0	5.0	7,063	38	NE.	S.	9	10	2	6	20	18	9	15	1	8	17	5	0	5	0	0	8	2	0	J.
4.2	.....	5.9	5.0	6,771	34	NE.	NW.†	1	8	1	10	3	15	9	15	0	12	8	11	0	10	0	0	3	3	0	J.
4.9	.....	4.7	4.8	6,747	37	W.	SW.	3	6	1	4	5	23	8	12	0	13	10	8	0	13	0	0	9	5	0	A.
6.1	.....	6.3	6.2	6,831	35	NE.	NW.†	1	15	3	4	1	6	11	15	4	7	7	16	0	14	0	0	0	3	0	S.
6.7	.....	4.3	5.5	7,788	44	NE.	NW.	2	5	0	7	3	12	9	22	2	9	10	12	0	16	0	0	0	1	0	O.
6.2	.....	5.5	5.8	8,818	42	NW.	NW.	1	15	2	0	7	9	8	18	0	9	1	20	0	14	1	7	0	0	0	N.
5.5	.....	4.3	4.9	8,770	48	NW.	NW.	1	4	0	3	5	13	13	22	1	14	7	10	0	8	2	18	0	0	0	D.
5.8	.....	5.1	5.5	93,077	.....	....	NW.	73	110	41	61	90	140	113	273	13	109	121	136	0	147	23	96	21	19	0	Y.

PITTSBURGH, PA.

[*H*=847. *T*=130. *h*=126.]

8.2	7.7	6.6	7.5	6,115	36	NW.	W.	12	8	11	5	2	8	29	18	0	2	10	19	0	22	12	26	0	0	0	J.
6.8	6.1	5.3	6.1	5,159	28	SE.	NW.	12	10	8	7	6	11	16	17	0	5	15	9	0	12	5	19	0	0	0	F.
7.5	7.9	5.6	7.0	6,356	39	SW.	NW.	15	7	5	7	5	9	12	33	0	4	13	14	0	15	7	19	0	1	0	M.
5.2	6.2	4.0	5.2	5,254	36	SW.†	NW.	17	9	3	2	8	8	9	34	0	9	11	10	0	14	0	3	0	2	0	A.
6.5	8.1	4.9	6.5	5,034	32	W.	NW.	9	10	16	7	8	14	10	19	0	2	19	10	0	18	0	0	0	7	0	M.
6.4	7.0	3.5	5.7	4,577	28	SW.	NW.	12	6	8	1	11	12	12	28	0	5	18	7	0	11	0	0	6	7	0	J.
4.9	.....	5.7	5.3	3,795	25	W.	NW.	12	7	6	4	3	5	6	17	2	7	17	7	0	11	0	0	1	7	0	J.
5.4	.....	5.2	5.3	3,709	36	SW.	NW.	3	5	2	1	10	8	8	21	4	9	13	9	0	9	0	0	2	6	0	A.
6.5	.....	5.9	6.2	4,030	24	W.	NW.	8	10	6	3	5	5	5	16	2	4	9	17	0	9	0	0	0	1	0	S.
7.4	.....	6.0	6.7	4,663	29	NW.	NW.	3	4	3	5	10	8	11	18	0	4	7	20	0	18	0	0	0	2	0	O.
6.0	.....	4.9	5.4	3,509	12	W.†	NW.	3	9	7	5	7	5	9	14	1	8	6	16	0	19	0	9	0	0	0	N.
7.1	.....	5.9	6.5	4,522	26	W.†	NW.	3	1	4	2	9	8	14	18	3	4	5	22	0	14	7	19	0	0	0	D.
6.5	.....	5.3	6.1	56,723	.....	....	NW.	109	86	79	49	84	101	141	253	12	63	143	160	0	172	31	95	9	33	0	Y.

POPLAR RIVER, MONTANA.

[*H*=2,002. *T*=8. *h*=2.]

4.4	5.4	2.2	4.0	3,404	42	NW.	W.	11	9	5	1	1	1	19	12	34	12	15	4	0	7	26	31	0	0	4	J.
5.5	7.0	3.6	5.4	4,079	37	W.	W.	15	7	16	0	0	0	21	9	19	9	13	7	0	9	18	29	0	0	4	F.
4.3	4.1	3.5	4.0	5,381	42	NW.†	NE.	17	24	9	3	0	2	22	11	5	10	17	4	0	8	21	31	0	0	2	M.
5.3	5.3	2.6	4.4	6,615	40	NW.	N.	19	13	12	12	4	1	16	13	0	10	17	3	0	7	2	19	0	2	6	A.
4.6	5.9	3.3	4.6	5,795	36	NW.	SE.	17	8	18	20	11	3	6	10	0	12	14	5	0	10	0	6	0	2	5	M.
5.5	5.9	5.3	5.5	6,924	40	NW.†	SE.	6	2	8	28	5	3	18	19	1	8	13	9	0	12	0	0	4	5	1	J.
3.8	.....	3.1	3.4	5,105	50	N.	W.	13	6	8	5	4	3	17	5	1	14	11	6	0	10	0	0	5	9	0	J.
4.4	.....	3.1	3.9	4,386	37	NW.	N.	16	7	4	9	1	3	9	8	5	13	12	6	0	6	0	0	4	3	0	A.
3.7	.....	3.5	3.6	5,421	38	N.	NW.	8	4	7	10	0	3	9	14	5	17	8	5	0	4	0	2	1	0	1	S.
5.2	.....	4.8	5.0	5,327	48	NW.†	W.	6	3	4	13	2	6	15	10	3	5	17	9	0	5	0	19	0	0	0	O.
2.8	.....	2.0	2.4	2,727	33	NW.	W.	11	6	2	5	5	1	14	10	6	19	8	3	0	2	3	29	0	0	0	N.
4.6	.....	4.1	4.4	3,056	37	NW.	W.	15	4	2	0	1	6	17	10	7	10	10	11	0	3	14	30	0	0	1	D.
4.5	.....	3.4	4.2	58,220	.....	....	W.	154	93	95	106	34	32	183	131	86	139	155	72	0	83	84	196	14	21	24	Y.

Monthly and yearly meteorological summaries—Continued.

PORT ANGELES, WASH.

[Latitude 48° 7′ N.; longitude 123° 6′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Mean. Maximum.	Mean. Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. in 24 hours.
	In.	*In.*	*In.*	°	°	°	°	°	°	°	°	°	°	°	°					*In.*	*In.*
J....	29.990	30.71	29.37	29.9	33.6	31.5	31.7	54	6	37.5	25.5	26	28	28	28	89	81	88	86	5.43	.94
F....	30.098	30.52	29.12	37.5	43.4	40.5	40.5	52	29	44.9	35.3	37	40	39	39	97	89	95	93	1.58	.56
M...	29.986	30.37	29.55	35.8	44.4	41.8	40.7	53	23	47.5	33.3	32	36	36	35	87	74	80	80	2.89	1.45
A....	30.076	30.33	29.58	40.5	49.4	48.3	46.1	61	30	52.7	38.4	37	43	43	41	88	79	83	83	1.56	.56
M...	29.964	30.19	29.63	42.3	55.3	54.5	50.7	74	33	59.4	40.4	40	45	46	44	90	70	75	78	.21	.15
J....	29.846	30.20	29.34	50.0	57.7	58.4	55.4	68	38	62.1	48.1	48	52	51	51	92	81	78	84	2.62	.68
J....	30.042	30.36	29.76	49.5	....	62.1	55.8	77	41	65.9	47.9	46	.....	53	50	90	.....	73	82	1.11	.30
A....	30.008	30.24	29.72	52.0	....	62.6	57.3	79	42	65.6	49.9	50	.....	54	52	92	.....	75	84	0.53	.49
S.....	30.006	30.45	29.71	50.0	....	61.4	55.7	77	38	63.6	47.5	48	.....	52	50	92	.....	74	83	0.72	.55
O....	29.970	30.35	29.54	46.4	....	51.5	49.0	62	31	55.2	43.3	44	.....	47	46	92	.....	86	89	4.31	.92
N....	30.010	30.39	29.65	37.8	....	42.7	40.2	55	24	47.2	34.6	35	.....	39	37	91	.....	88	90	3.77	1.38
D....	29.923	30.40	29.35	36.6	....	41.4	39.0	55	24	46.4	35.7	34	.....	37	36	91	.....	85	88	3.44	.80
Y ...	29.993	30.71	29.12	42.4	....	49.7	46.8	79	6	54.0	40.0	40	.....	44	42	91	.....	82	85	28.2	....

PORT HURON, MICH.

[Latitude, 43° 0′ N.; longitude, 82° 26′ W.]

J....	29.496	30.15	28.74	14.0	19.5	15.1	16.2	44	-7	22.5	8.8	12	14	11	12	92	78	82	84	1.46	0.50
F....	29.353	30.12	28.53	18.8	25.7	22.4	22.3	48	-13	30.0	14.7	16	18	17	17	90	73	81	81	1.78	0.81
M...	29.411	29.79	28.73	20.4	29.9	25.2	25.2	61	-4	33.4	17.5	17	20	20	19	86	68	80	78	2.24	0.60
A....	29.454	29.86	28.83	35.6	45.0	39.4	40.0	82	20	48.9	31.6	29	30	29	29	78	59	69	69	1.25	0.72
M...	29.275	29.71	28.87	47.7	56.6	49.4	51.2	80	28	60.6	42.7	41	44	41	42	79	64	75	73	2.40	0.89
J....	29.271	29.58	28.92	59.7	71.0	62.5	64.4	93	37	75.1	54.7	53	56	56	55	80	61	79	73	2.45	0.60
J....	29.366	29.53	29.10	65.5	....	67.9	66.7	89	49	76.1	58.6	58	.....	57	58	76	.....	70	73	3.24	0.96
A....	29.340	29.64	29.09	64.0	....	67.3	65.6	91	41	75.8	56.9	58	.....	59	58	80	.....	76	78	0.99	0.52
S....	29.386	29.76	28.92	53.9	....	57.8	55.8	82	32	66.9	47.9	49	.....	49	49	84	.....	74	79	1.89	1.52
O....	29.282	29.69	28.71	42.5	....	45.5	44.0	72	27	51.6	38.6	37	.....	37	37	80	.....	73	76	2.52	0.64
N....	29.441	29.92	28.92	36.5	....	40.4	38.4	67	20	47.2	34.3	31	.....	32	32	82	.....	74	78	2.63	1.40
D....	29.356	29.81	28.84	28.4	....	31.4	29.9	53	9	37.5	25.6	22	.....	24	23	79	.....	74	76	1.48	0.59
Y....	29.369	30.15	28.53	40.6	....	43.7	43.3	93	-13	52.1	36.0	35	.....	36	36	82	.....	76	76	24.33	....

PORTLAND, ME.

[Latitude 43° 39′ N.; longitude 70° 15′ W.]

J.....	29.935	30.74	28.88	10.7	18.5	13.8	14.3	47	-12	22.4	6.2	5	10	8	7	77	70	77	75	6.05	1.93
F ...	29.933	30.33	29.38	19.3	27.9	22.4	23.2	44	-7	31.2	13.4	14	18	15	16	81	68	74	74	5.40	2.25
M...	29.844	30.51	29.20	26.2	34.2	29.0	29.8	47	7	35.2	22.4	20	22	21	21	79	63	73	72	3.72	1.34
A ...	29.942	30.38	29.41	36.8	43.3	37.5	39.2	64	16	46.1	30.5	28	28	28	28	71	58	70	66	3.80	1.85
M...	29.900	30.17	29.64	47.7	51.8	47.0	48.8	67	32	55.0	42.2	43	46	43	44	85	81	87	84	3.36	1.38
J.....	29.777	30.14	29.41	61.1	67.8	60.1	63.0	96	45	71.7	54.3	54	57	55	55	77	69	83	77	2.79	1.22
J.....	29.837	30.19	29.10	66.1	....	65.0	65.6	87	50	73.3	57.1	56	.....	56	56	70	.....	75	73	1.90	.67
A ...	29.808	30.18	29.39	65.0	....	64.6	64.8	85	48	73.6	57.5	57	.....	57	57	76	.....	79	78	4.36	1.22
S.....	29.952	30.56	29.33	55.4	....	54.9	55.2	78	33	62.6	49.0	51	.....	51	51	86	.....	86	86	8.22	2.05
O ...	29.783	30.40	29.16	42.6	....	44.0	43.3	61	29	49.9	36.8	38	.....	38	38	84	.....	81	82	7.47	2.05
N ...	29.987	30.69	29.31	37.2	....	38.3	37.8	67	7	45.1	31.2	31	.....	32	32	80	....	80	80	7.46	1.77
D ...	29.816	30.41	28.89	28.4	....	30.2	29.3	57	2	35.9	23.5	20	.....	22	21	73	.....	73	73	4.71	1.87
Y ...	29.876	30.74	28.88	41.4	....	42.2	42.9	96	-12	50.2	35.3	35	.....	35	35	78	.....	78	77	59.3	......

PORTLAND, OREGON.

[Latitude, 45° 32′ N.; longitude 122° 43′ W.]

J.....	29.984	30.68	29.43	27.2	32.0	30.8	30.0	62	-2	36.6	22.0	24	28	28	27	88	86	89	88	8.50	1.79
F....	30.080	30.48	29.47	40.6	45.7	45.6	44.0	61	30	51.6	36.0	40	42	42	41	96	86	88	90	2.42	.79
M ,..	29.950	30.33	29.52	40.0	50.2	48.5	46.2	68	24	55.7	36.4	38	38	40	39	92	65	75	77	2.87	.84
A ...	30.042	30.27	29.68	47.0	59.4	58.6	55.0	84	32	66.5	44.1	44	44	44	44	91	58	62	70	2.06	.40
M ...	29.877	30.15	29.55	51.8	67.2	67.8	62.3	91	38	75.1	49.6	47	46	47	47	84	48	50	61	0.68	.40
J....	29.824	30.18	29.41	56.3	65.4	64.1	61.9	87	48	71.3	54.5	53	53	55	54	90	66	72	76	5.38	.94
J....	29.966	30.26	29.72	56.1	....	76.2	66.2	97	46	80.3	54.8	52	.....	53	53	86	.....	48	67	1.04	.68
A ...	29.921	30.19	29.68	58.1	....	79.9	69.0	92	52	81.8	56.3	56	.....	56	56	92	.....	46	69	0.05	.05
S.....	29.917	30.22	29.59	57.1	....	74.4	65.8	90	44	77.3	54.7	54	.....	54	54	88	.....	53	71	1.13	.86
O....	29.965	30.34	29.63	51.6	....	59.3	55.4	82	37	63.7	48.9	50	.....	52	51	93	.....	77	85	4.97	.96
N ...	30.003	30.31	29.65	41.8	....	46.1	44.0	58	31	49.2	38.7	38	.....	40	39	87	.....	82	84	4.47	1.01
D ...	29.910	30.36	29.44	41.8	....	45.4	43.6	59	31	48.6	38.8	37	.....	39	38	85	.....	79	82	5.19	1.48
Y ...	29.953	30.68	29.41	47.4	....	58.1	53.6	97	-2	63.1	44.6	44	.....	46	45	90	.....	68	77	38.8	....

Monthly and yearly meteorological summaries—Continued.

PORT ANGELES, WASH.

[*H*=14. *T*=20. *h*=1.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
7.5	7.6	6.9	7.4	3,281	30	NE.	S.	7	8	5	12	31	8	6	3	13	1	12	18	0	18	10	23	0	0	0	J.
8.1	8.1	7.5	7.9	1,837	18	W.	S.	1	6	12	8	23	9	11	2	15	1	10	18	0	16	0	6	0	0	0	F.
6.0	6.6	6.7	6.4	3,453	32	W.	S.	8	13	6	0	33	11	12	1	9	7	10	14	0	12	0	17	0	0	0	M.
6.5	7.2	7.3	7.0	3,434	30	W.	S.	1	3	12	8	27	8	18	12	1	1	15	14	0	11	0	3	0	0	0	A.
4.3	3.2	3.2	3.5	5,639	30	W.	W.	0	3	10	7	18	11	31	10	3	15	13	3	0	4	0	0	0	0	0	M.
8.1	6.7	7.1	7.3	3,576	27	W.	W.	4	3	7	6	19	11	26	14	0	3	10	17	0	15	0	0	0	1	0	J.
4.3	.....	4.2	4.2	4,124	25	W.	S.	0	0	3	2	23	6	22	6	0	14	10	7	0	9	0	0	0	0	0	J.
4.5	.....	4.4	4.4	4,328	24	W.	W.	0	0	2	6	20	4	22	7	1	16	8	7	0	3	0	0	0	1	0	A.
4.8	.....	4.0	4.4	3,028	24	W.	S.	0	0	6	5	30	5	10	2	2	14	7	9	0	6	0	0	0	0	0	S.
7.7	.....	7.7	7.7	2,655	23	W.	S.	0	1	4	13	30	5	6	0	3	3	4	24	0	19	0	1	0	0	0	O.
6.4	.....	7.8	7.1	2,764	22	NE.	S.	0	2	3	6	37	10	2	0	0	4	7	19	0	20	0	9	0	0	0	N.
6.4	.....	6.4	6.4	2,435	24	NE.	S.	0	0	1	12	46	3	0	0	0	5	13	13	0	18	0	9	0	0	0	D.
6.2	.....	6.1	6.1	40,554	.....	....	S.	21	39	71	85	337	91	166	57	47	84	119	163	0	151	10	68	0	2	0	Y.

PORT HURON, MICH.

[*H* = 639. *T* = 70. *h* = 66.]

6.9	6.4	5.8	6.4	8,587	60	SW.	NW.	4	4	3	12	7	22	11	30	0	4	17	10	0	13	26	31	0	0	0	J.
6.5	7.5	5.2	6.4	8,253	48	SW.	S.	8	4	8	6	20	18	12	11	0	4	15	10	0	8	14	29	0	0	0	F.
5.9	7.0	6.0	6.3	9,551	43	W.	W.	19	6	7	5	13	8	22	12	1	5	15	11	0	16	14	29	0	0	0	M.
3.9	5.0	4.1	4.4	8,629	48	W.	N.	18	17	8	8	15	7	10	7	0	11	13	6	0	8	0	18	0	1	0	A.
5.9	5.9	5.3	5.7	7,688	41	W.	N.	20	11	16	8	6	11	16	5	0	5	16	10	0	14	0	1	0	2	0	M.
5.0	4.2	3.5	4.2	7,314	41	W.	S.	19	10	8	4	25	9	12	3	0	11	16	3	0	11	0	0	1	5	0	J.
3.8	.....	4.5	4.2	6,487	47	W.	N.	15	13	2	2	11	8	5	5	1	8	16	7	0	6	0	0	0	4	0	J.
4.5	.....	4.9	4.7	7,881	37	N.	N.	13	6	3	1	12	12	5	7	3	13	7	11	0	5	0	0	2	1	0	A.
3.5	.....	3.0	3.2	7,497	34	SW.	W.	5	5	8	7	9	7	15	3	1	14	9	7	0	6	0	1	0	1	0	S.
7.1	.....	6.0	6.6	8,157	36	NW.†	SW.	3	10	2	10	5	12	10	10	0	7	6	18	0	15	0	4	0	1	0	O.
7.2	.....	7.3	7.2	8,705	37	N.	NW.	2	4	7	6	11	7	10	12	1	8	6	16	0	11	0	11	0	1	0	N.
7.7	.....	7.3	7.5	10,476	42	SW.	S.	1	0	3	2	17	13	10	15	1	4	5	22	0	11	6	24	0	0	0	D.
5.7	.....	5.2	5.6	99,225	.....	....	S.	127	90	75	71	151	134	138	120	8	94	141	131	0	124	60	148	3	16	0	Y.

PORTLAND, ME.

[*H*=99. *T*=81. *h*=71.]

5.4	5.3	3.6	4.8	5,478	36	N.†	NW.	22	2	0	0	2	9	24	26	8	11	12	8	0	14	23	31	0	0	0	J.
5.4	4.6	4.9	5.0	4,249	28	SE.†	NW.	12	3	0	6	9	5	11	22	19	7	13	9	0	11	14	28	0	0	0	F.
5.8	7.1	5.2	6.1	6,793	45	S.	NW.†	13	5	3	7	11	1	24	24	5	6	14	11	0	11	8	26	0	0	0	M.
5.3	5.3	4.5	5.0	5,024	32	E.	NW.	10	2	4	10	9	7	18	22	8	9	13	8	0	11	0	19	0	0	0	A.
6.4	7.5	5.8	6.6	4,758	25	E.†	E.	10	10	16	6	14	7	7	11	12	4	15	12	0	12	0	0	0	0	1	M.
4.6	5.6	4.4	4.8	5,044	27	S.	S.	3	3	5	8	23	12	10	11	15	10	15	5	0	11	0	0	1	6	2	J.
4.2	.....	5.6	4.9	5,603	35	W.	S.	7	6	1	2	14	7	5	9	11	12	10	9	0	10	0	0	0	2	0	J.
6.1	.....	3.1	4.6	5,654	30	NW.†	SW.	4	2	6	3	9	16	8	9	5	11	9	11	0	13	0	0	0	2	0	A.
6.4	.....	5.0	5.7	5,128	33	NW.	SW.	10	7	2	4	7	11	5	9	5	7	9	14	0	11	0	0	0	0	0	S.
6.1	.....	6.6	6.4	6,078	29	NW.	NW.	8	4	3	4	4	6	12	19	2	7	5	19	0	15	0	2	0	0	0	O.
5.7	.....	5.4	5.6	6,819	38	N.	SW.†	15	7	0	1	5	15	7	7	3	8	8	14	0	14	4	13	0	0	0	N.
7.3	.....	4.0	5.6	6,717	34	NE.	SW.	7	3	1	1	5	20	13	11	1	6	8	17	0	7	9	25	0	0	0	D.
5.7	.....	4.8	5.4	67,345	.....	....	NW.	121	54	41	52	112	116	114	180	94	98	131	137	0	140	58	144	1	10	3	Y.

PORTLAND, OREGON.

[*H* = 80. *T* = 85. *h* = 77.]

5.7	6.7	6.8	6.4	3,622	30	S,	NW.	4	12	14	16	15	4	0	20	8	9	6	16	0	19	12	21	0	0	0	J.
6.1	7.5	5.1	6.3	2,519	30	S.	NW.	4	0	0	8	23	2	1	25	24	5	15	9	0	12	0	5	0	0	0	F.
5.8	7.2	5.8	6.2	3,739	40	S.	NW.	2	1	6	5	21	2	1	31	24	3	16	12	0	14	0	6	0	0	0	M.
5.4	6.6	6.8	6.3	3,751	22	SE.†	NW.	6	0	1	5	25	5	4	36	8	7	8	15	0	13	0	0	0	0	0	A.
4.6	3.7	3.9	4.1	4,052	22	NW.	NW.	6	2	2	6	8	6	1	52	10	14	12	5	0	6	0	0	2	0	0	M.
9.1	8.4	8.3	8.6	4,016	25	S.	NW.	3	0	0	14	24	13	2	30	4	2	2	26	0	22	0	0	0	4	0	J.
4.6	.....	3.4	4.0	4,473	20	NW.	NW.	6	2	2	3	12	2	3	23	9	17	4	10	0	5	0	0	7	0	0	J.
2.8	.....	1.9	2.4	3,530	18	S.	NW.	3	0	0	0	2	1	1	37	18	23	4	4	0	1	0	0	2	0	0	A.
4.0	.....	4.7	4.4	3,977	23	NW.	NW.	3	3	1	3	14	2	0	27	7	11	11	8	0	7	0	0	1	1	0	S.
6.4	.....	7.6	7.0	3,191	27	S.	S.	1	1	1	9	22	8	2	15	3	3	7	21	0	19	0	0	0	0	0	O.
6.2	.....	7.4	6.8	3,800	30	SW.†	NW.	2	3	6	9	17	2	1	18	2	4	5	21	1	17	0	1	0	0	0	N.
5.1	.....	6.9	6.0	3,596	28	S.	S.	3	5	7	15	19	2	2	7	2	7	7	17	1	15	0	1	0	0	0	D.
5.5	.....	5.7	5.7	44,266	.....	....	NW.	43	29	40	93	202	49	18	321	119	105	97	164	2	150	12	34	12	5	0	Y.

Monthly and yearly meteorological summaries—Continued.

PUEBLO, COLO.

[Latitude, 38° 18′ N.; longitude, 104° 36′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	7 a.m.	3 p.m.	10 p.m.	Mean.	Total.	Max. 24 hours.
1888	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J....	....	....	....	....	....	....	....	......	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
F....	....	....	....	....	....	....	....	......	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
M....	....	....	....	....	....	....	....	......	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
A....	....	....	....	....	....	....	....	......	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
M....	....	....	....	....	....	....	....	......	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
J....	....	....	....	....	....	....	....	......	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
J....	25.354	25.57	25.10	65.5	....	84.1	74.8	103	51	92.5	61.9	51	.....	45	48	61	.....	31	46	1.33	0.74
A....	25.364	25.61	25.10	59.7	....	79.2	69.4	100	47	85.4	56.8	46	.....	40	43	64	.....	32	48	.64	.44
S....	25.389	25.63	25.17	51.1	....	75.5	63.3	96	38	82.0	49.2	37	.....	35	36	60	.....	24	42	.04	.04
O....	25.270	25.54	24.97	42.0	....	59.1	50.6	84	25	66.0	39.2	26	.....	26	26	58	.....	32	45	.48	.39
N....	25.311	25.58	25.00	27.1	....	42.3	34.7	72	13	51.4	24.4	18	.....	16	17	70	.....	40	55	.59	.43
D....	25.294	25.72	24.78	25.2	....	39.9	32.6	68	10	51.4	22.0	16	.....	14	15	72	.....	39	55	.10	.06
Y....	....	....	....	....	....	....	....	......	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....

RALEIGH, N. C.

[Latitude, 35° 47′ N.; longitude, 78° 78′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temp. 7 a.m.	Temp. 3 p.m.	Temp. 10 p.m.	Temp. Mean.	Temp. Maximum.	Temp. Minimum.	Temp. Mean Maximum.	Temp. Mean Minimum.	Dew point 7 a.m.	Dew point 3 p.m.	Dew point 10 p.m.	Dew point Mean.	Rel. hum. 7 a.m.	Rel. hum. 3 p.m.	Rel. hum. 10 p.m.	Rel. hum. Mean.	Precip. Total.	Precip. Max. 24 hours.
J....	29.821	30.35	29.46	35.1	45.4	39.5	40.0	75	17	49.0	31.9	31	35	31	33	84	69	81	78	3.98	1.10
F....	29.701	30.24	29.22	38.2	51.0	43.1	44.1	68	15	53.6	35.8	35	41	38	38	87	71	83	80	3.86	1.88
M....	29.706	30.07	29.08	40.5	54.1	45.9	46.8	77	20	56.9	36.8	36	41	39	39	84	63	78	75	6.88	1.87
A....	29.756	30.22	29.33	51.5	68.3	57.6	59.1	90	35	70.4	47.4	46	49	49	48	80	51	73	68	1.71	1.18
M....	29.601	29.88	29.35	61.7	73.8	64.2	66.6	90	44	76.2	58.0	56	58	57	57	83	60	79	74	6.07	1.26
J....	29.591	29.92	29.36	70.5	84.0	73.4	76.0	101	52	86.5	65.9	64	62	64	63	79	49	73	67	4.06	2.21
J....	29.661	29.85	29.39	73.3	....	78.2	75.8	101	58	89.5	67.4	65	.....	68	66	75	.....	72	74	4.93	3.70
A....	29.674	29.86	29.38	74.2	....	77.8	76.0	96	53	88.1	68.1	68	.....	68	68	81	.....	74	78	4.05	2.93
S....	29.668	29.93	29.41	65.6	....	67.6	66.6	88	39	76.7	60.4	61	.....	61	61	87	.....	80	81	10.88	2.73
O....	29.653	30.02	29.20	52.7	....	57.7	55.2	77	33	65.6	46.1	46	.....	47	46	78	.....	69	74	4.31	1.71
N....	29.751	30.14	29.29	47.7	....	52.2	50.0	79	30	59.9	42.2	42	.....	44	43	82	.....	74	78	3.01	0.83
D....	29.762	30.21	29.00	36.4	....	43.4	39.9	68	18	51.8	31.5	29	.....	31	30	75	.....	63	69	3.18	1.41
Y....	29.695	30.35	29.00	54.0	....	58.4	58.0	101	15	69.0	49.0	48	.....	50	49	81	.....	75	75	56.9	....

RAPID CITY, DAK.

[Latitude, 44° 4′ N.; longitude, 103° 12′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temp. 7 a.m.	Temp. 3 p.m.	Temp. 10 p.m.	Temp. Mean.	Temp. Maximum.	Temp. Minimum.	Temp. Mean Maximum.	Temp. Mean Minimum.	Dew point 7 a.m.	Dew point 3 p.m.	Dew point 10 p.m.	Dew point Mean.	Rel. hum. 7 a.m.	Rel. hum. 3 p.m.	Rel. hum. 10 p.m.	Rel. hum. Mean.	Precip. Total.	Precip. Max. 24 hours.
J....	26.643	27.03	26.08	4.1	19.5	8.6	10.7	66	-30	23.6	-2.8	-2	12	3	4	77	72	77	75	0.33	0.15
F....	26.570	27.07	26.20	23.3	35.5	26.8	28.5	59	-3	39.8	16.9	18	26	21	22	81	70	79	77	1.62	0.51
M....	26.599	26.95	26.11	17.9	32.3	24.5	24.9	66	-16	36.1	12.9	13	21	19	19	81	73	80	78	1.76	0.75
A....	26.640	27.13	26.05	39.3	60.7	48.7	49.6	84	20	64.0	34.6	31	34	35	33	73	42	62	59	0.41	0.20
M....	26.555	26.95	26.23	43.4	54.7	50.2	49.4	75	22	59.9	40.4	37	39	41	39	81	60	72	71	6.01	2.02
J....	26.448	26.75	26.04	56.7	70.5	64.6	63.9	99	40	74.9	53.0	49	52	52	51	76	54	65	65	4.74	2.12
J....	26.673	26.86	26.43	65.8	....	76.1	71.0	100	51	83.0	59.4	54	.....	56	55	68	.....	52	60	1.69	0.44
A....	26.681	26.90	26.48	58.8	....	71.1	65.0	91	42	77.5	54.8	49	.....	53	51	73	.....	55	64	4.76	1.63
S....	26.690	26.97	26.37	50.6	....	68.0	59.3	94	35	76.2	47.4	38	.....	40	39	63	.....	37	50	0.02	0.02
O....	26.582	26.87	26.10	40.5	....	48.3	44.4	79	21	58.8	36.6	25	.....	27	26	58	.....	46	52	0.43	0.30
N....	26.651	27.00	26.28	28.5	....	33.6	31.0	68	10	47.8	23.8	21	.....	24	23	75	.....	71	73	0.47	0.39
D....	26.600	27.04	26.16	26.2	....	31.8	29.0	68	-4	44.8	20.8	18	.....	21	20	73	.....	68	70	0.51	0.29
Y....	26.611	27.13	26.04	37.9	....	46.0	43.9	100	-30	57.2	33.2	29	.....	33	32	73	.....	64	66	22.7	....

RED BLUFF, COLO.

[Latitude, 40° 10′ N.; longitude, 122° 15′ W.]

Months and year.	Pressure. Mean.	Pressure. Maximum.	Pressure. Minimum.	Temp. 7 a.m.	Temp. 3 p.m.	Temp. 10 p.m.	Temp. Mean.	Temp. Maximum.	Temp. Minimum.	Temp. Mean Maximum.	Temp. Mean Minimum.	Dew point 7 a.m.	Dew point 3 p.m.	Dew point 10 p.m.	Dew point Mean.	Rel. hum. 7 a.m.	Rel. hum. 3 p.m.	Rel. hum. 10 p.m.	Rel. hum. Mean.	Precip. Total.	Precip. Max. 24 hours.
J....	29,765	30.27	29.16	36.9	43.6	42.3	40.9	60	18	47.4	34.0	28	29	32	30	76	63	71	70	4.08	0.66
F....	29.744	30.01	29.40	46.3	58.7	56.6	53.9	82	34	63.8	42.8	36	36	37	36	71	49	54	58	2.17	0.96
M....	29.661	30.12	29.31	47.3	58.8	57.3	54.5	78	32	63.8	43.4	34	33	36	34	65	45	52	54	3.47	1.25
A....	29.667	29.92	29.44	55.0	73.8	72.3	67.0	93	41	80.1	51.7	45	49	50	48	71	43	47	54	0.53	0.53
M....	29.542	29.73	29.38	56.7	73.6	74.1	68.1	96	48	80.8	54.3	47	46	47	47	72	41	42	51	0.51	0.15
J....	29.536	29.79	29.33	60.7	75.7	75.8	70.7	99	49	82.5	57.8	52	50	48	50	73	42	42	53	2.61	0.84
J....	29.550	29.84	29.40	67.6	....	94.1	80.9	109	54	96.7	65.7	48	.....	40	44	52	.....	16	34	0.07	0.04
A....	29.506	29.71	29.28	69.7	....	97.6	83.6	108	55	98.0	66.9	47	.....	41	44	47	.....	16	31	0.00	0.00
S....	29.506	29.69	29.28	69.4	....	92.9	81.2	106	55	93.7	66.7	48	.....	45	46	48	.....	22	35	0.33	0.33
O....	29.600	29.85	29.38	58.0	....	78.5	68.2	92	44	79.2	54.7	39	.....	36	38	52	.....	24	38	T.	T.
N....	29.678	29.85	29.38	48.9	....	60.8	54.8	73	36	62.2	45.7	38	.....	39	38	70	.....	55	63	4.32	1.61
D....	29.715	29.98	29.24	45.2	....	51.4	48.3	61	35	52.7	43.2	44	.....	46	45	95	.....	82	88	6.85	1.43
Y....	29.622	30.27	29.16	55.1	....	71.1	64.3	109	18	75.1	52.2	42	.....	41	42	66	.....	44	52	24.9	....

Monthly and yearly meteorological summaries—**Continued.**

PUEBLO, COLO.

[*H*=4,724. *T*=10. *h*=9.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	J.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	F.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	M.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	A.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	M.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	J.
3.4	.....	6.1	4.8	4,894	36	W.	NW.	12	2	9	8	6	1	6	14	4	8	16	7	0	6	0	0	20	7	0	J.
3.7	.....	6.7	5.2	4,504	42	W.	NW.	8	2	9	6	3	6	7	19	2	8	15	8	0	7	0	0	10	7	0	A.
1.8	.....	3.9	2.8	3,752	36	NE.	NW.	5	5	17	10	2	1	1	18	1	21	8	1	0	1	0	0	4	1	0	S.
4.8	.....	4.8	4.8	4,369	38	NW.	NW.	8	3	12	4	4	4	7	15	5	11	9	11	0	3	0	5	0	0	0	O.
4.3	.....	3.1	3.7	3,384	40	N.	NW.†	8	2	14	5	4	2	8	14	3	13	10	7	0	3	0	23	0	0	0	N.
3.3	.....	2.1	2.7	4,293	30	NW.	NW.	14	1	6	6	5	2	9	17	2	16	11	4	0	3	1	30	0	0	0	D.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Y.

RALEIGH, N. C.

[*H*=375. *T*=65. *h*=2.]

7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
7.1	6.1	5.0	6.1	4,902	25	NW.	NW.	6	19	4	1	3	21	6	33	0	7	11	13	0	16	2	17	0	0	0	J.
6.4	5.7	4.5	5.5	4,039	33	NW.	SW.	14	16	4	2	3	21	4	19	4	7	12	10	0	12	0	8	0	1	0	F.
5.3	5.5	3.5	4.8	5,489	30	NW.†	NW.	8	8	8	3	10	19	6	31	0	13	8	10	0	10	0	12	0	0	0	M.
3.6	3.0	2.2	3.0	4,866	27	N.	NW.†	13	19	4	6	4	18	5	19	2	17	9	4	0	5	0	0	0	2	0	A.
7.3	6.4	5.6	6.4	3,866	24	NE.†	SW.	10	13	6	6	14	27	6	11	0	4	15	12	0	19	0	0	0	4	0	M.
4.5	3.9	3.2	3.9	2,858	24	N.	SW.	12	20	2	2	3	26	7	15	3	13	14	3	0	8	0	0	13	3	0	J.
4.4	.....	5.2	4.8	3,154	24	NE.	N.	12	8	7	8	7	5	4	11	0	11	12	8	0	11	0	0	12	2	0	J.
4.0	.....	4.2	4.1	3,288	30	NE.	SW.	7	6	0	6	6	24	7	6	0	14	12	5	0	10	0	0	12	3	0	A.
6.4	.....	5.5	6.0	3,671	20	N.	NW.	13	10	3	1	6	8	4	15	0	9	3	18	0	16	0	0	0	0	0	S.
4.5	.....	4.3	4.4	3,830	30	NE.	NW.†	9	7	2	1	8	16	3	16	0	15	4	12	0	10	0	0	0	0	0	O.
5.3	.....	4.8	5.0	4,345	20	NW.†	NW.	12	6	3	2	13	6	3	15	0	10	9	11	0	10	0	3	0	0	0	N.
2.8	.....	2.6	2.7	2,863	20	NW.	NW.	9	4	0	2	2	11	5	17	12	21	4	6	0	8	0	16	0	0	0	D.
5.1	.....	4.2	4.7	47,261	.....	....	NW.	125	136	43	40	79	202	60	208	21	141	113	112	0	135	2	56	37	15	0	Y.

RAPID CITY, DAK.

[*H*=3,280. *T*=50. *h*=43.]

7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
3.3	4.9	2.9	3.7	2,426	29	N.	W.	23	3	3	4	10	5	28	12	5	14	15	2	0	4	21	29	0	0	0	J.
4.3	6.8	4.0	5.0	5,014	42	W.	N.	24	5	4	4	7	4	16	8	15	6	18	5	0	9	7	26	0	0	0	F.
5.8	6.8	4.4	5.6	6,503	36	N.	NE.	20	21	6	8	12	4	6	13	3	9	9	13	0	11	13	28	0	2	0	M.
3.9	5.0	3.6	4.2	7,732	46	SW.	NW.	13	15	6	5	12	12	7	18	2	12	13	5	0	6	0	10	0	2	1	A.
6.5	7.2	7.0	6.9	6,579	38	N.	NW.	19	10	5	17	4	5	7	20	6	5	10	16	0	19	0	3	0	7	0	M.
6.4	6.4	7.2	6.7	7,825	44	SW.	S.†	22	4	0	9	22	3	11	17	2	4	13	13	0	15	0	0	2	5	0	J.
4.9	.....	4.8	4.8	6,348	36	SW.	N.	16	0	7	4	13	0	14	6	2	9	12	10	0	11	0	0	3	4	0	J.
3.9	.....	5.0	4.4	4,965	48	S.	W.	9	5	4	7	8	5	12	5	7	11	10	10	0	17	0	0	2	0	0	A.
1.7	.....	3.1	2.4	6,094	48	NW.	NW.	11	0	1	6	9	1	9	14	9	20	7	3	0	1	0	0	3	0	0	S.
4.3	.....	4.6	4.4	6,335	40	N.	NW.†	12	1	2	2	8	1	16	16	4	11	14	6	0	8	0	8	0	0	0	O.
2.9	.....	1.6	2.2	4,798	40	N.	NW.	10	0	2	3	2	3	14	23	3	20	8	2	0	4	2	28	0	0	0	N.
3.3	.....	3.8	3.6	5,034	42	N.	NW.	12	3	3	2	1	3	10	27	1	14	12	5	0	5	5	28	0	0	0	D.
4.3	.....	4.3	4.5	69.654	.....	....	N.	191	67	43	71	108	46	150	179	59	135	141	90	0	110	48	160	10	20	1	Y.

RED BLUFF, COLO.

[*H*=342. *T*=54. *h*=44.]

7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.7	5.9	5.7	5.8	5,856	45	S.†	N.	33	2	2	15	15	0	2	17	7	9	7	15	0	15	0	14	0	1	0	J.
2.5	3.5	2.8	3.0	4,810	38	N.	N.	40	0	1	6	11	2	10	8	9	16	9	4	0	5	0	0	0	0	0	F.
3.2	4.1	4.6	3.9	7,644	40	S.	N.	30	3	2	14	23	2	5	10	4	14	10	7	0	12	0	0	0	0	0	M.
1.6	1.8	2.4	1.9	4,355	26	NW.†	N.†	26	1	1	1	26	2	16	9	8	18	12	0	0	2	0	0	6	0	1	A.
2.9	3.3	4.3	3.5	5,136	30	S.	S.	17	3	0	10	44	4	2	5	8	16	11	4	0	5	0	0	2	2	0	M.
3.2	3.8	4.2	3.7	5,188	42	S.	S.	14	0	0	6	37	0	4	13	16	15	11	4	0	11	0	0	6	2	0	J.
1.2	.....	1.0	1.1	4,909	29	S.	S.	16	0	1	10	23	1	4	0	7	27	4	0	0	2	0	0	26	0	0	J.
0.4	.....	1.6	1.0	3,512	24	N.	S.	12	0	0	2	23	0	0	8	17	27	3	1	0	0	0	0	27	1	0	A.
2.0	.....	1.6	1.8	4,067	31	S.	N.	18	1	1	0	16	0	3	8	13	24	5	1	0	2	0	0	19	4	0	S.
1.1	.....	1.5	1.3	4,989	36	N.	N.	22	0	0	1	13	0	3	11	12	26	5	0	0	0	0	0	2	0	0	O.
3.8	.....	4.5	4.2	4,190	26	N.	N.	25	0	0	1	14	1	4	7	8	13	6	11	0	8	0	0	0	0	0	N.
6.5	.....	7.5	7.0	3,313	25	SE.	N.	19	1	3	7	10	0	4	5	9	2	6	21	0	17	0	0	0	0	0	D.
2.8	.....	3.5	3.2	57,969	.....	....	N.	272	11	11	73	255	12	57	101	118	207	89	68	0	79	0	14	88	10	1	Y.

Monthly and yearly meteorological summaries—Continued.

RIO GRANDE CITY, TEX.

[Latitude, 26° 23′ N.; longitude, 98° 48′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a.m.	8 p.m.	10 p.m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a.m.	8 p.m.	10 p.m.	Mean.	7 a.m.	8 p.m.	10 p.m.	Mean.	Total.	Max. 24 hours.
	In.	*In.*	*In.*	°	°	°	°	°	°	°	°	°	°	°	°					*In.*	*In.*
J.....	30.029	30.57	29.58	48.9	60.2	54.9	54.7	86	21	65.1	46.4	46	48	50	48	91	67	85	81	0.67	0.18
F....	29.838	30.81	29.55	56.1	71.2	63.4	63.6	85	43	75.2	54.5	54	54	56	55	95	57	78	77	0.16	0.12
M ...	29.851	30.36	29.40	58.0	70.6	64.1	64.2	89	41	74.2	56.3	55	55	57	56	90	62	79	77	1.84	1.36
A....	29.840	30.14	29.63	68.7	81.5	73.2	74.5	92	59	83.7	67.6	67	68	68	68	95	65	83	81	3.50	2.24
M ...	29.678	29.89	29.42	72.3	86.0	77.5	78.6	100	63	89.1	71.3	71	70	71	71	95	60	82	79	1.31	0.64
J.....	29.686	29.82	29.50	74.6	88.7	80.4	81.2	97	66	91.6	73.6	74	72	73	73	98	60	80	79	4.00	2.34
J.....	29.796	29.91	29.65	75.6	....	89.2	82,4	99	71	96.9	74.5	74	.....	71	72	93	.....	56	75	0,64	0.54
A.....	29.739	29.95	29.58	75.8	....	88.5	82.3	104	72	98.0	74.9	74	.....	71	73	94	.....	58	76	1.40	0.73
S.....	29.820	30.06	29.69	69.9	....	80.2	75.0	98	59	89.7	69.4	69	.....	68	68	96	.....	69	82	5.53	2.27
O....	29.806	30.06	29.61	67.5	....	76.7	72.1	94	53	86.0	66.6	67	.....	67	67	98	.....	74	86	1.57	0.97
N ...	29.908	30.18	29.50	57.9	....	64.9	61.4	90	37	71.8	56.4	56	.....	55	56	94	.....	73	83	1.36	0.59
D....	29.954	30.31	29.59	50.1	....	64.3	57.2	84	33	72.6	48.9	48	.....	49	49	94	.....	62	78	0.76	0.32
Y ...	29.829	30.57	29.40	64.6	....	73.1	70.6	104	21	82.8	63.4	63	.....	63	63	94	.....	73	80	22.7	....

ROCHESTER, N. Y.

[Latitude, 43° 8′ N.: longitude, 77° 42′ W.]

J.....	29.478	30.18	28.90	15.3	19.3	17.1	17.2	48	-6	25.7	9.9	12	16	14	14	88	88	88	88	1.87	0.32
F ...	29.385	30.04	28.74	21.0	27.1	24.5	24.2	57	-8	34.2	16.2	16	19	19	18	82	74	79	78	0.85	0.30
M...	29.401	29.81	28.55	22.1	26.9	25.0	24.7	59	0	32.9	18.1	18	21	20	20	87	80	83	83	2.34	0.54
A ...	29.442	29.88	28.92	36.2	45.6	39.7	40.5	80	21	49.0	32.9	29	28	30	29	78	53	71	67	1.22	0.32
M...	29.311	29.68	28.94	50.8	58.4	53.2	54.1	78	33	62.4	46.9	43	41	42	42	77	56	68	67	1.79	0.40
J.....	29.274	29.57	28.98	61.6	73.0	65.2	66.6	95	42	76.8	56.3	54	53	53	53	78	52	65	65	4.69	1.66
J.....	29.357	29.55	28.90	65.1	....	70.3	67.7	90	48	77.7	57.8	54	.....	53	54	68	.....	55	62	1.12	0.54
A ...	29.330	29.62	28.97	65.2	....	69.2	67.2	87	46	76.0	59.2	55	.....	56	55	70	.....	63	66	3.61	1.20
S......	29.409	29.87	28.95	55.0	....	59.3	57.2	81	35	66.6	49.4	48	.....	50	49	78	.....	73	75	2.19	0.80
O ...	29.286	29.69	28.70	41.4	....	45.7	43.6	72	29	50.7	37.6	37	.....	37	37	86	.....	74	80	3.22	0.68
N ...	29.452	29.97	28.90	38.4	....	40.4	39.4	73	11	46.9	34.0	33	.....	33	33	82	....	77	79	2.86	0.46
D ...	29.342	29.84	28.80	28.8	....	31.4	30.1	56	6	35.5	24.5	23	.....	25	24	81	......	78	80	2.00	0.59
Y ...	29.372	30.13	28.55	41.7	....	45.1	44.4	95	-8	52.9	36.9	35	.....	36	36	79	.....	73	74	27.8	....

ROSEBURGH, OREGON.

[Latitude, 43° 13′ N.; longitude, 123° 20′ W.]

J.....	29.495	30.10	28.86	31.7	37.1	36.4	35.1	71	-6	42.3	27.1	28	31	30	30	87	79	81	82	6.62	2.50
F....	29.605	29.96	29.10	40.0	46.7	46.8	44.5	67	28	54.7	36.8	38	40	40	40	93	78	80	84	2.81	0.59
M ...	29.474	29.80	28.98	39.3	50.8	51.5	47.2	71	23	58.1	35.7	35	39	39	38	86	66	64	72	2.39	0.65
A....	29.568	29.76	29.26	45.1	61.9	60.9	56.0	84	29	69.0	42.0	42	44	43	43	88	53	54	65	0.63	0.19
M ...	29.407	29.64	29.15	48.7	65.8	65.9	60.1	93	36	73.6	45.8	45	47	46	46	86	52	51	63	1.15	0.64
J.....	29.870	29.72	28.96	54.2	65.8	63.9	61.3	86	44	71.0	51.9	51	51	52	52	91	60	67	73	5.94	1.27
J.....	29.489	29.75	29.21	54.7	....	77.2	66.0	100	45	81.3	53.0	51	......	53	52	86	.....	45	65	1.05	1.02
A	29.444	29.70	29.21	55.5	....	82.8	69.2	93	47	84.3	53.1	53	.....	53	53	90	......	37	64	0.07	0.07
S......	29.446	29.69	29.14	54.5	....	78.6	66.6	99	41	81.1	51.5	51	......	52	52	90	......	43	66	0.63	0.27
O	29.516	29.89	29.19	48.9	....	64.0	56.4	83	33	67.1	45.9	47	.....	50	49	94	.....	64	79	2.82	1.43
N.....	29.522	29.82	29.17	44.2	....	49.7	47.0	62	31	53.8	40.3	42	.....	45	44	94	.....	85	89	3.54	0.70
D.....	29.426	29.80	28.97	42.8	....	48.8	45.8	66	32	53.9	39.9	41	.....	43	42	94	.....	84	89	3.54	2.23
Y.....	29.480	30.10	28.86	46.6	....	60.5	54.6	100	-6	65.8	43.6	44	.....	46	45	90	.....	63	74	31.2	....

SACRAMENTO, CAL.

[Latitude, 38° 35′ N.; longitude, 121° 30′ W.]

J.....	30.056	30.55	29.44	38.8	45.5	44.1	42.8	63	19	49.9	35.7	36	36	38	37	90	72	79	80	4.81	1.90
F ...	30.015	30.23	29.72	46.3	56.0	55.6	52.6	75	31	62.2	43.7	42	42	44	43	87	62	67	72	0.57	0.20
M ...	29.943	30.41	29.57	46.8	57.5	56.5	53.6	76	37	62.7	44.5	41	42	43	42	82	58	64	68	3.04	0.91
A....	29.952	30.20	29.74	51.0	68.9	67.1	62.3	89	41	76.7	49.2	47	49	52	49	87	49	59	65	0.10	0.09
M ...	29.836	30.02	29.66	51.6	69.7	64.2	61.8	90	46	75.1	50.3	48	50	51	50	89	52	63	68	0.40	0.36
J.....	29.831	30.04	29.64	56.7	74.8	71.6	67.7	96	48	80.8	55.2	51	51	53	52	82	44	53	60	0.08	0.04
J.....	29.834	30.14	29.68	58.1	....	85.1	71.6	104	51	89.5	57.3	51	.....	54	52	78	.....	36	57	T.	T.
A....	29.779	29.97	29.56	60.4	....	90.5	75.4	108	51	94.5	59.2	52	.....	58	55	76	....	34	55	T.	T.
S.....	29.774	29.97	29.51	61.2	....	86.2	73.7	106	50	91.4	59.5	52	.....	56	54	74	.....	38	56	0.55	0.43
O ...	29.860	30.06	29.69	58.5	....	75.0	64.2	92	40	79.7	50.8	46	.....	52	49	77	.....	47	62	0.00	0.00
N ...	29.938	30.18	29.62	46.8	....	60.3	53.6	75	32	64.2	43.9	40	.....	45	42	80	.....	62	71	4.28	2.12
D ...	30.002	30.26	29.42	46.0	....	50.8	48.4	63	36	53.2	43.7	44	.....	47	46	94	.....	89	92	4.63	1.10
Y ...	29.902	30.55	29.42	51.4	....	67.2	60.6	108	19	73.3	49.4	46	.....	49	48	83	.....	58	67	18.46	....

Monthly and yearly meteorological summaries—**Continued.**

RIO GRANDE CITY, TEX.

[*H*=230. *T*=17. *h*=14.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.6	7.1	6.4	6.7	4,452	36	SE.	SE.	18	12	5	22	18	1	1	2	14	5	10	16	0	11	1	4	0	0	0	J.
4.9	6.6	3.1	4.9	4,268	30	SE.	SE.	23	4	5	24	13	0	7	2	9	8	15	6	0	2	0	0	0	0	0	F.
6.3	6.8	5.1	6.0	5,336	28	S.	SE.	17	8	16	31	14	0	3	3	1	7	12	12	0	6	0	0	0	1	0	M.
6.0	5.4	3.4	5.0	6,314	28	N.†	SE.	6	2	17	50	14	0	1	0	0	9	12	9	0	7	0	0	4	1	0	A.
6.2	4.1	2.7	4.3	5,624	24	N.†	S.	4	9	8	27	42	0	1	0	2	9	18	4	0	5	0	0	11	2	0	M.
4.4	5.3	2.8	4.2	4,907	24	SE.	SE.	0	4	11	64	3	0	0	0	8	11	15	4	0	8	0	0	21	0	0	J.
1.3	.....	1.9	1.6	5,359	.....	....	SE.	0	2	20	34	2	0	0	0	4	22	5	4	0	2	0	0	31	0	0	J.
1.9	.....	4.3	3.1	5,000	24	NE.†	SE.	0	1	11	41	1	0	0	0	8	14	8	9	0	7	0	0	30	1	0	A.
3.9	.....	6.0	5.0	2,650	23	SE.	NE.	9	17	7	11	1	1	2	1	11	4	9	17	0	14	0	0	17	0	0	S.
3.1	.....	3.6	3.4	3,787	23	SE.	SE.	7	5	13	26	1	1	1	1	7	9	6	16	0	8	0	0	6	0	0	O.
7.4	.....	5.4	6.4	3,488	28	N.	N.	18	11	6	11	1	1	0	1	11	6	9	15	0	10	0	0	1	0	0	N.
3.6	....	3.3	3.4	4,010	24	SE.	N.	16	4	15	15	1	1	1	2	7	13	10	8	0	5	0	0	0	0	0	D.
4.6	.....	4.0	4.5	55,195	.....	....	SE.	118	79	134	356	111	5	17	12	82	117	129	120	0	85	1	4	121	5	0	Y.

ROCHESTER, N. Y.

[*H*=621. *T*=156. *h*=145.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
7.6	7.5	6.6	7.2	9,961	53	W.	W.	2	7	2	12	6	11	29	24	0	2	13	16	0	22	26	31	0	0	0	J.
8.2	7.0	5.9	7.0	8,536	45	W.	W.	4	3	4	11	12	11	29	12	1	1	15	13	0	12	10	27	0	0	0	F.
7.0	7.7	6.7	7.2	10,552	58	W.	W.	3	4	6	7	8	4	33	28	0	3	12	16	0	24	15	27	0	0	0	M.
4.6	4.8	4.4	4.5	8,789	42	W.	NW.	9	7	7	6	2	10	23	26	0	11	13	6	0	11	0	18	0	3	0	A.
7.1	7.4	4.5	6.3	7,437	43	SW.	SE.	14	6	5	25	7	9	18	9	0	5	17	9	0	15	0	0	0	3	0	M.
5.5	4.7	2.8	4.4	6,406	44	W.	W.	11	8	6	2	3	22	27	10	1	10	16	4	0	11	0	0	3	3	0	J.
3.0	.....	3.8	3.4	3,833	52	NW.	W.	5	10	1	3	3	13	15	10	2	12	14	5	0	8	0	0	1	1	0	J.
4.9	.....	2.8	3.8	3,705	31	W.	SW.	3	8	1	1	3	21	15	10	0	12	13	6	0	7	0	0	0	0	0	A.
5.2	.....	3.7	4.4	6,235	31	SW.	SW.	4	7	2	5	4	16	12	8	2	10	11	9	0	12	0	0	0	0	0	S.
7.5	.....	6.1	6.8	8,040	36	W.	W.	2	5	1	9	2	11	18	14	0	3	13	15	0	19	0	5	0	0	0	O.
7.9	.....	7.1	7.5	8,237	34	W.	W.	6	2	6	4	8	15	16	3	0	5	8	17	0	15	2	11	0	0	0	N.
7.2	.....	8.3	7.8	9,279	36	W.	SW.	3	1	2	0	5	20	19	12	0	2	4	25	0	19	10	24	0	0	0	D.
6.3	.....	5.2	5.9	90,960	.....	....	W.	66	68	43	85	63	163	254	166	6	76	149	141	0	175	63	143	4	10	0	Y.

ROSEBURGH, OREGON.

[*H*=523. *T*=54. *h*=47.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.7	7.3	6.5	6.8	2,316	30	S.	S.	6	4	0	8	16	8	10	7	34	5	10	16	0	18	8	19	0	0	0	J.
5.2	6.8	3.3	5.1	1,568	31	S.	W.	4	13	8	2	1	9	17	7	26	8	16	5	0	14	0	8	0	0	0	F.
4.9	6.3	5.3	5.5	3,111	25	SE.†	NW.	14	8	3	10	8	8	8	17	17	7	10	14	0	9	0	10	0	0	0	M.
4.5	4.2	4.6	4.4	2,640	36	SW.	N.	17	6	2	3	4	13	12	16	17	11	11	8	0	7	0	1	0	0	0	A.
4.7	3.9	4.6	4.4	2,940	22	N.	NW.	20	7	3	1	6	9	10	26	11	12	12	7	0	8	0	0	1	7	0	M.
7.8	8.0	6.7	7.5	2,678	24	W.†	W.	10	3	14	5	5	5	23	14	11	2	9	19	0	21	0	0	0	3	0	J.
4.5	.....	2.6	3.6	3,133	20	N.	N.	22	3	4	2	1	1	3	8	18	19	7	5	0	2	0	0	8	0	0	J.
3.0	.....	1.6	2.2	2,616	18	N.	N.	23	3	13	0	0	0	3	9	11	22	8	1	0	1	0	0	5	1	0	A.
3.3	.....	3.9	3.6	2,394	20	S.	N.	15	3	14	0	3	0	4	13	8	16	10	4	0	5	0	0	6	1	0	S.
5.6	.....	6.3	6.0	2,118	25	SW.	N.	17	3	6	2	7	2	7	11	7	5	15	11	0	15	0	0	0	0	0	O.
7.5	.....	7.8	7.6	1,627	19	S.	NW.	3	4	11	5	5	4	8	13	7	2	12	16	0	18	0	1	0	0	0	N.
5.2	.....	7.1	6.2	2,154	19	SE.	E.	4	2	15	8	5	5	9	12	2	4	15	12	0	15	0	1	0	0	0	D.
5.2	.....	5.0	5.2	29,295	.....	....	N.	155	59	93	46	61	64	114	153	169	113	135	118	0	133	8	40	20	12	0	Y.

SACRAMENTO, CAL.

[*H*=64. *T*=61. *h*=57.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.2	6.0	4.8	5.3	4,380	36	N.	SE.†	25	2	2	25	12	8	2	7	9	8	12	10	0	14	0	12	0	0	0	J.
1.8	2.9	1.2	2.0	4,500	36	NW.	SE.	16	2	1	19	12	12	0	17	8	21	7	1	0	5	0	0	0	0	0	F.
3.1	4.0	3.1	3.4	6,736	48	SE.	NW.	1	1	1	21	16	17	1	31	4	17	8	6	0	8	0	0	0	0	0	M.
1.4	2.2	1.5	1.7	4,140	24	SW.	SW.	12	0	2	16	16	19	6	11	8	23	5	2	0	2	0	0	0	0	0	A.
2.9	2.4	3.0	2.8	5,934	24	SW.	SW.	5	0	1	21	20	38	4	4	0	19	10	2	0	2	0	0	0	1	0	M.
2.8	3.3	3.4	3.2	5,494	36	SW.	SW.	6	0	1	17	19	34	2	9	2	17	9	4	0	4	0	0	2	0	0	J.
0.8	.....	0.8	0.8	5,905	24	SW.	S.	0	0	0	13	25	15	0	6	3	29	2	0	0	0	0	0	15	0	0	J.
0.3	.....	0.6	0.4	4,226	18	SW.†	S.	4	0	0	18	19	13	0	4	4	30	1	0	0	0	0	0	23	0	0	A.
1.8	.....	1.6	1.7	4,033	24	SW.†	S.	3	3	1	18	19	8	1	6	1	24	3	3	0	2	0	0	17	2	0	S.
0.4	....	1.0	0.7	4,682	36	N.†	SE.	11	3	2	14	9	6	0	10	7	28	3	0	0	0	0	0	1	0	0	O.
2.6	....	4.0	3.3	3,487	21	NW.	SE.	9	4	1	16	5	2	0	11	12	17	7	6	0	7	0	0	0	0	0	N.
4.8	.....	7.7	6.2	3,447	36	SE.	SE.	12	2	4	16	8	7	3	8	2	5	8	18	0	14	0	0	0	0	0	D.
2.3	.....	2.7	2.6	56,964	.....	....	SE.	104	17	16	214	180	179	19	124	60	238	75	52	0	58	0	12	58	3	0	Y.

Monthly and yearly meteorological summaries—Continued.

SALT LAKE CITY, UTAH.

[Latitude, 40° 46′; longitude, 111° 54′.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J.....	25.683	26.28	25.02	18.8	28.4	22.5	23.2	53	-17	32.1	13.7	13	16	16	15	79	61	76	72	1.52	0.62
F ...	25.656	25.93	25.15	34.4	42.9	38.1	38.5	59	24	45.7	30.9	26	29	29	28	72	60	71	68	1.22	0.38
M ...	25.568	26.06	25.18	35.5	45.2	40.6	40.4	68	19	48.8	31.1	24	28	29	27	66	52	65	61	2.18	0.61
A....	25.654	25.94	25.22	47.3	62.1	57.0	55.5	80	31	66.7	42.9	29	30	31	30	52	36	42	43	0.99	0.62
M ...	25.524	25.77	25.27	50.7	64.7	60.5	58.6	84	38	69.6	47.5	35	39	39	38	55	41	46	48	0.34	0.09
J	25.490	25.69	25.20	60.2	76.1	70.1	68.8	93	45	80.5	56.3	40	44	44	43	50	34	41	42	0.98	0.51
J	25.644	25.85	25.51	67.4	....	85.6	76.5	98	52	90.0	63.3	46	.....	46	46	48	.....	28	38	0.24	0.11
A....	25.642	25.78	25.50	65.9	....	83.5	74.7	98	54	87.7	61.8	41	.....	42	42	42	.....	26	34	0.63	0.32
S....	25.678	25.85	25.50	61.2	....	78.7	70.0	92	48	84.3	56.9	37	.....	40	39	43	.....	28	35	0.51	0.46
O....	25.634	25.83	25.38	49.5	....	58.4	54.0	78	32	64.4	43.7	30	.....	32	31	50	.....	40	45	0.80	0.22
N....	25.666	25.92	25.46	37.5	....	43.9	40.7	63	26	49.3	33.9	28	.....	31	29	70	.....	61	66	2.00	0.92
D....	25.707	26.06	25.27	31.7	....	38.0	34.8	57	9	43.3	28.3	24	.....	27	26	74	.....	67	70	2.21	1.38
Y....	25.629	26.28	25.02	46.7	....	56.4	53.0	98	-17	63.5	42.5	31	.....	34	33	58	.....	49	52	13.6	....

SAN ANTONIO, TEX.

[Latitude, 29° 27′; longitude, 98° 28′.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
J	29.436	29.95	29.03	42.1	53.9	48.1	48.0	77	11	58.1	38.6	38	42	42	41	86	68	80	78	1.61	0.55
F....	29.242	29.71	28.92	49.9	62.5	57.1	56.5	78	38	67.3	48.7	46	47	48	47	88	60	73	74	2.56	1.04
M ...	29.265	29.73	28.80	50.8	61.9	57.0	56.6	79	37	66.3	48.7	44	45	46	45	80	58	68	69	2.13	1.15
A ...	29.261	29.54	29.05	63.6	74.9	69.3	69.3	86	50	78.5	62.7	62	60	62	61	93	62	78	78	7.72	2.54
M....	29.101	29.33	28.87	66.9	79.2	72.3	72.8	91	54	82.9	64.8	64	65	65	65	91	63	78	77	4.25	1.00
J.....	29.108	29.28	28.93	71.9	85.3	76.8	78.0	94	61	87.8	70.6	70	69	70	70	94	59	80	78	4.00	1.13
J	29.223	29.35	29.06	74.9	....	87.2	81.0	95	64	93.1	71.6	70	.....	65	68	85	.....	49	67	0.79	0.52
A....	29.163	29.39	28.99	75.3	....	86.8	81.0	99	69	93.2	72.4	70	.....	66	68	84	.....	52	68	7.76	4.22
S.....	29.239	29.49	29.12	67.8	....	77.6	72.7	92	58	84.8	65.7	63	.....	63	63	86	.....	62	74	1.93	0.86
O....	29.215	29.47	29.04	62.0	.. ..	72.3	67.2	88	40	80.6	60.2	59	.....	59	59	91	.....	64	78	0.82	0.35
N....	29.308	29.55	28.86	51.1	....	57.9	54.5	86	34	64.5	49.6	47	.....	48	48	88	.....	71	80	4.58	1.47
D....	29.340	29.62	28.99	47.3	....	57.4	52.4	75	35	65.0	46.1	41	.....	42	42	81	.....	60	70	2.40	1.32
Y ...	29.242	26.95	28.80	60.3	......	68.3	65.8	99	11	76.8	58.3	56	....	56	56	87	.. ..	68	74	40.6	......

SAN DIEGO, CAL.

[Latitude, 32° 43′; longitude, 117° 10′.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
J.....	30.056	30.33	29.63	46.6	56.0	52.2	51.6	64	33	58.2	44.8	40	45	45	44	80	69	77	76	1.96	1.05
F....	29.991	30.18	29.73	49.8	59.5	55.3	54.9	67	42	61.4	47.5	45	48	49	47	84	68	79	77	1.48	0.75
M ...	29.983	30.22	29.70	51.1	60.0	56.3	55.8	72	41	62.2	48.8	48	52	51	50	88	75	82	81	2.79	1.24
A ...	29.963	30.14	29.79	55.7	65.3	61.3	60.8	93	47	61.8	54.7	52	55	55	54	90	70	80	80	0.10	0.08
M ...	29.901	30.05	29.77	58.0	64.7	60.8	61.2	70	52	66.9	56.9	54	54	54	54	85	68	79	77	0.22	0.15
J.....	29.854	29.98	29.71	61.4	70.1	66.6	66.0	76	54	72.4	60.4	59	61	61	60	91	74	83	83	0.04	0.04
J.....	29.880	30.03	29.79	64.0	....	72.7	68.4	77	55	71.4	62.5	61	.....	63	62	91	.....	72	82	0.01	0.01
A ...	29.830	29.95	29.74	64.7	....	72.1	68.4	82	57	74.6	63.7	62	.....	64	63	91	.....	77	84	T.	T.
S.....	29.794	29.95	29.62	65.6	....	70.8	68.2	82	58	74.8	64.6	64	.....	66	65	93	.....	84	89	0.04	0.04
O ...	29.852	29.99	29.71	60.9	....	66.1	63.5	80	53	70.5	59.4	59	.....	62	60	93	.....	88	91	0.26	0.20
N ...	29.920	30.05	29.64	55.5	....	62.0	58.8	75	46	66.0	53.8	51	.....	57	54	87	.....	84	86	1.83	0.60
D ...	29.976	30.15	29.68	52.7	....	60.3	56.5	73	44	65.2	51.1	49	.....	56	52	87	.....	86	86	2.84	1.04
Y ...	29.915	30.33	29.62	57.2	....	63.0	61.2	93	33	67.4	55.7	54	.....	57	55	88	.....	81	83	11.57	....

SANDUSKY, OHIO.

[Latitude, 41° 27′; longitude, 82° 43′.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
J	29.526	30.18	28.81	19.3	23.5	20.7	21.2	54	- 2	29.4	13.3	16	17	17	17	88	78	85	83	2.14	0.95
F.....	29.389	30.14	28.63	23.7	30.2	26.9	26.9	53	- 3	25.1	19.3	19	21	21	20	82	70	80	77	1.26	0.58
M.....	29.435	29.79	28.81	26.5	34.8	31.2	30.8	72	6	40.1	23.2	21	24	24	23	81	68	77	75	2.85	0.80
A.....	29.475	29.88	28.89	41.6	49.6	45.1	45.4	85	28	55.0	37.7	31	31	34	32	68	52	66	62	1.61	0.44
M....	29.296	29.67	28.94	52.3	59.3	55.2	55.6	84	37	63.9	48.4	43	46	45	45	72	62	70	68	2.30	1.16
J	29.300	29.58	29.02	64.8	73.7	67.8	68.8	93	44	78.9	60.1	56	58	58	57	76	60	72	69	3.96	1.30
J	29.378	29.51	29.14	69.4	....	73.2	71.3	90	57	80.7	64.1	60	.....	61	60	72	.....	66	69	3.58	2.11
A.....	29.360	29.62	29.08	67.5	....	72.1	69.8	95	49	80.6	62.5	58	.....	59	59	73	.....	65	69	1.98	0.60
S	29.398	29.69	28.98	57.0	....	62.4	59.7	87	39	69.9	53.8	49	.....	51	50	76	.....	68	72	1.41	0.93
O	29.304	29.67	28.81	45.5	....	48.6	47.0	76	33	54.2	41.6	38	.....	40	39	75	.....	72	74	1.89	0.38
N.....	29.454	29.88	29.00	40.4	....	44.1	42.2	76	25	49.1	37.8	32	.....	35	33	73	.....	71	72	2.35	0.81
D.....	29.402	29.82	28.93	31.1	....	34.4	32.8	61	15	38.3	27.9	24	.....	26	25	77	.....	73	75	1.12	0.36
Y....	29.393	30.18	28.63	44.9	....	48.5	47.6	95	33	56.3	40.8	37	.....	39	38	76	.....	72	72	26.5	....

Monthly and yearly meteorological summaries—**Continued.**

SALT LAKE CITY, UTAH.

H=4,348. *T*=90. *h*=77.

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
3.9	5.7	4.1	4.5	3,776	40	S.	SE.	2	11	10	24	15	3	5	11	12	13	10	8	0	8	15	30	0	0	0	J.
5.1	6.4	4.7	5.4	3,201	28	E.	NW.	5	17	8	13	10	1	6	21	6	5	16	8	0	7	0	17	0	0	0	F.
6.0	6.5	3.9	5.5	4,736	36	NE.	SE.	10	14	4	26	13	3	3	18	2	8	12	11	0	10	0	17	0	0	0	M.
2.7	4.1	2.5	3.1	4,160	30	S.	NW.	13	14	14	15	5	2	1	24	2	17	10	3	0	5	0	1	0	0	0	A.
4.6	6.8	6.1	5.8	4,562	28	NE.†	NW.	18	9	8	17	7	4	6	23	1	6	15	10	0	8	0	0	0	2	0	M.
4.1	4.5	4.2	4.3	4,989	40	SE.	SE.	10	15	9	26	9	0	2	19	0	10	15	5	0	5	0	0	2	2	0	J.
3.8	.....	4.4	4.1	4,123	32	S.	SE.†	2	4	6	22	3	0	0	22	3	11	17	3	0	4	0	0	15	1	0	J.
1.8	.....	3.4	2.6	4,333	42	SW.	NW.	3	3	8	16	4	2	4	21	1	20	10	1	0	5	0	0	11	2	0	A.
1.9	.....	2.4	2.2	2,947	25	NW.	SE.	1	1	0	24	1	1	7	23	2	23	6	1	0	4	0	0	4	1	0	S.
4.0	.. ..	3.5	3.8	3,619	25	S.	NW.	3	4	7	14	2	1	4	22	5	19	5	7	0	7	0	1	0	1	0	O.
4.1	.....	5.4	4.8	2,648	26	S.	NW.	1	2	1	18	6	0	2	27	3	12	6	12	0	8	0	8	0	0	0	N.
3.8	.....	3.8	3.8	2,441	22	S.	SE.	0	10	0	25	1	2	0	12	12	13	9	9	0	8	4	22	0	0	0	D.
3.8	.....	4.0	4.2	45,535	.....	....	NW.	68	104	75	240	76	19	40	243	49	157	131	78	0	79	19	96	32	9	0	Y.

SAN ANTONIO, TEX.

[*H*=781. *T*=17. *h*=1.]

7.3	8.0	7.4	7.6	6,133	36	N.	SE.	22	16	3	23	14	3	3	3	6	3	9	19	0	14	2	11	0	1	0	J.
5.6	6.5	4.6	5.6	6,046	36	SE.†	NE.	19	22	5	15	10	8	4	2	2	7	14	8	0	10	0	0	0	2	0	F.
8.8	7.8	6.6	7.7	7,298	36	NE.	NE.	9	31	8	29	8	3	3	1	1	2	11	18	0	12	0	0	0	1	0	M.
8.2	7.3	5.3	6.9	6,434	34	N.	SE.	9	13	7	43	16	2	0	0	0	4	12	14	0	13	0	0	0	5	0	A.
8.3	6.8	5.3	6.8	6,377	34	NE.	SE.	6	21	8	31	23	1	3	0	0	2	17	12	0	13	0	0	1	9	0	M.
8.5	6.1	5.0	6.5	5,852	34	NE.	SE.	2	8	10	44	22	1	1	1	1	2	14	14	0	12	0	0	7	5	0	J.
5.6	.....	4.0	4.8	5,291	30	NE.	SE.	6	11	2	27	13	2	0	1	0	8	21	2	0	3	0	0	29	3	0	J.
5.4	.....	5.8	5.6	5,718	30	NE.	SE.	9	6	12	22	11	0	0	1	1	7	15	9	0	6	0	0	24	8	0	A.
4.9	.....	5.3	5.1	4,157	28	E.	NE.	12	26	9	9	2	1	0	1	0	9	8	13	0	9	0	0	3	4	0	S.
6.7	.....	3.8	5.2	5,503	25	S.	SE.	7	21	2	22	9	0	1	0	0	9	10	12	0	8	0	0	0	0	0	O.
7.3	.....	5.5	6.4	6,303	34	N.	NE.	13	28	5	4	7	1	2	0	0	6	7	17	0	13	0	0	0	2	0	N.
5.1	.....	5.0	5.0	6,390	28	N.	NE.	15	18	2	12	5	5	3	2	0	13	5	13	0	7	0	0	0	0	0	D.
6.8	.....	5.3	6.1	71,502	.....	....	SE.	129	221	73	281	140	27	20	12	11	72	143	151	0	120	2	11	64	40	0	Y.

SAN DIEGO, CAL.

[*H* = 66. *T* = 23. *h* = 42.]

4.4	5.4	4.8	4.9	3,714	36	S.	W.	16	11	6	8	4	8	17	9	14	11	12	8	0	8	0	0	0	0	0	J.
3.8	4.4	4.2	4.1	3,121	24	W.	NW.	11	12	5	1	5	10	14	17	12	12	11	6	0	5	0	0	0	0	1	F.
6.3	6.0	4.2	5.5	4,312	21	SW.	W.	16	3	2	2	9	14	20	18	9	9	10	12	0	10	0	0	0	0	0	M.
5.5	4.9	5.1	5.2	3,918	24	N.†	NW.†	20	6	0	1	1	16	17	20	9	9	9	12	0	3	0	0	1	1	0	A.
8.4	6.7	6.7	7.2	4,772	21	NW.	NW.	20	1	1	0	3	10	22	33	3	3	11	17	0	6	0	0	0	0	0	M.
7.5	2.2	5.2	5.0	4,218	21	NW.	SW.	8	1	0	0	3	35	21	19	3	5	17	8	0	1	0	0	0	0	0	J.
8.1	.....	1.7	4.9	4,198	18	NW.	NW.	13	0	0	0	0	16	7	21	5	23	4	4	0	1	0	0	0	0	0	J.
7.5	.....	1.9	4.7	4,084	21	NW.	NW.	16	2	0	0	0	13	8	19	4	20	8	3	0	0	0	0	0	1	0	A.
7.5	.....	3.8	5.6	3,758	24	NW.	NW.	15	1	0	0	0	13	8	21	2	16	3	11	0	1	0	0	0	1	0	S.
6.9	.....	5.1	6.0	3,434	22	NE.	SW.	9	5	0	3	3	14	7	13	8	15	4	12	0	3	0	0	0	0	0	O.
5.0	.....	5.1	5.0	3,216	23	NW.	NW.	4	8	8	3	4	6	8	13	6	12	5	13	0	6	0	0	0	0	0	N.
3.2	.....	5.0	4.1	3,594	36	W.	NE.	14	15	5	3	5	4	3	9	4	18	2	11	0	9	0	0	0	0	0	D.
6.2	.....	4.4	5.2	46,339	.....	....	NW.	162	65	27	21	37	159	152	212	79	153	96	117	0	53	0	0	1	3	1	Y.

SANDUSKY, OHIO.

[*H* = 629. *T* = 64. *h* = 55.]

7.4	6.8	7.7	7.1	9,570	48	W.	W.	6	5	11	6	10	14	25	15	1	3	10	18	0	16	18	30	0	0	0	J.
5.2	6.0	4.8	5.4	8,783	41	SW.	SW.	10	2	16	3	13	22	11	9	1	9	10	10	0	9	11	28	0	0	0	F.
6.5	6.9	6.0	6.5	11,326	43	W.	NW.†	11	8	11	6	9	18	12	18	0	6	10	15	0	11	9	22	0	0	0	M.
4.2	5.0	4.1	4.5	7,298	42	NW.	E.	10	11	18	8	9	10	7	17	0	14	7	9	0	7	0	4	0	2	1	A.
5.3	5.9	5.9	5.7	7,224	36	NW.	E.	4	6	26	9	11	13	12	12	0	5	18	8	0	10	0	0	0	4	1	M.
5.5	4.7	4.6	4.7	6,388	32	W.	SW.	7	15	13	6	11	18	13	7	0	8	17	5	0	10	0	0	3	6	0	J.
4.6	.....	6.0	5.3	5,575	30	SW.	SE.	2	11	11	12	8	8	7	3	0	0	23	8	0	8	0	0	1	4	0	J.
6.1	.....	5.3	5.7	6,135	28	N.	SW.	7	5	5	9	5	23	7	1	0	0	24	7	0	7	0	0	3	5	0	A.
5.8	.....	3.2	5.4	6,335	27	N.	SW.†	7	4	6	9	10	10	7	7	0	5	19	6	0	9	0	0	0	0	0	S.
7.1	.....	5.1	6.1	7,578	35	NW.	SW.	7	4	2	8	8	17	7	9	0	5	9	17	0	13	0	0	0	1	0	O.
7.6	.....	7.0	7.3	7,809	36	W.	SW.	3	4	6	6	11	12	7	11	0	2	10	18	0	12	0	10	0	0	0	N.
8.6	.....	6.6	7.6	8,597	36	N.	SW.	6	1	0	1	14	21	5	14	0	1	10	20	0	10	9	21	0	0	0	D.
6.2	.....	5.5	5.9	92,618	.....	....	SW.	80	76	125	83	119	186	120	123	2	58	167	141	0	122	47	115	7	22	2	Y.

Monthly and yearly meteorological summaries—Continued.

SAN FRANCISCO, CAL.

[Latitude, 37°, 48′ N.; longitude, 122°, 26′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	7 a.m.	3 p.m.	10 p.m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J	30.056	30.50	29.47	43.9	48.2	46.9	46.3	63	29	51.8	41.6	38	38	39	38	81	72	75	76	6.81	1.58
F ...	30.040	30.25	29.77	49.2	55.8	53.3	52.8	76	42	60.7	47.1	44	44	45	44	85	69	75	76	0.94	0.38
M ...	29.968	30.40	29.57	49.1	56.4	52.0	52.5	74	38	60.2	46.7	43	42	43	43	83	63	73	73	3.60	1.34
A ...	30.011	30.24	29.83	51.1	62.0	55.6	56.2	88	46	65.9	49.8	47	48	47	47	86	61	74	74	0.11	0.11
M ...	29.907	30.11	29.73	51.7	60.0	54.5	55.4	81	47	62.9	50.9	48	48	48	48	86	66	81	78	0.38	0.19
J	29.895	30.09	29.74	56.9	65.9	60.1	61.0	80	53	68.9	55.9	53	53	54	53	87	63	80	77	0.27	0.10
J	29.922	30.15	29.75	55.2	......	62.9	59.1	93	51	68.4	54.4	51	......	52	52	87	......	70	79	0.01	0.01
A ...	29.862	30.03	29.69	54.3	......	61.4	57.8	85	51	68.4	53.1	52	......	53	52	92	......	74	83	0.01	0.01
S	29.848	30.03	29.56	56.1	......	62.0	59.0	88	50	70.5	54.8	54	......	54	54	92	......	75	84	0.98	0.92
O ...	29.912	30.08	29.78	56.0	......	61.1	58.6	87	50	69.4	53.9	51	......	50	50	86	......	71	78	0.13	0.05
N ...	29.953	30.14	29.62	52.7	......	57.5	55.1	74	47	62.7	51.4	48	......	48	48	87	......	74	80	3.99	1.68
D ...	29.984	30.23	29.40	50.5	......	54.2	52.4	65	43	57.2	49.2	48	......	48	48	90	......	80	85	5.80	1.51
Y ...	29.946	30.50	29.40	52.2	......	56.8	55.5	93	29	63.9	50.7	48	......	48	48	87	......	75	78	23.03	......

SANTE FÉ, N. MEX.

[Latitude, 35° 41′ N.; longitude, 105° 57′ W.]

J....	23.251	23.66	22.94	24.7	36.1	30.0	30.3	58	-2	39.7	20.4	16	18	16	17	70	50	59	60	0.44	0.20
F ...	23.193	23.52	22.95	29.4	41.5	35.7	35.5	55	16	44.6	27.1	21	23	23	22	72	50	62	62	0.90	0.52
M...	23.174	23.55	22.74	30.3	43.8	38.0	37.4	64	14	49.1	27.3	20	18	20	20	68	43	52	54	0.61	0.23
A...	23.312	23.59	23.06	41.1	58.0	50.7	49.9	72	29	61.9	39.3	27	27	28	27	60	36	47	47	1.42	0.43
M...	23.213	23.39	23.04	44.1	61.3	54.9	53.4	76	34	65.4	42.1	26	20	24	23	52	24	34	37	0.70	0.37
J ...	23.260	23.45	23.08	56.2	76.1	69.1	67.1	87	42	79.4	54.2	29	25	24	26	38	16	22	25	0.16	0.05
J ...	23.417	23.57	23.26	62.5	......	75.0	68.8	90	51	82.0	58.3	46	......	41	44	57	......	23	45	1.98	0.55
A...	23.403	23.63	23.24	57.5	......	72.2	64.8	90	40	78.3	53.4	40	......	36	38	57	......	34	45	2.08	0.82
S ...	23.416	23.56	23.29	52.1	......	67.8	60.0	82	43	75.7	50.3	36	......	34	35	55	......	30	42	0.38	0.26
O...	23.292	23.49	23.03	41.8	......	54.9	48.4	72	30	62.1	39.9	26	......	27	26	59	......	40	50	1.40	0.91
N....	23.261	23.48	23.00	32.1	......	38.7	35.4	64	12	46.4	28.7	21	......	23	22	66	......	58	62	1.30	0.86
D...	23.289	23.56	22.99	27.5	......	33.3	30.4	52	16	41.8	24.8	18	......	20	19	68	......	59	64	0.66	0.43
Y ...	23.290	23.66	22.74	41.6	......	51.7	48.4	90	-2	60.5	38.8	27	......	26	27	60	......	44	49	12.0	......

SAULT DE STE. MARIE, MICH.

[Latitude, 46° 28′ N.; longitude, 84° 22′ W.]

J....	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
F....	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
M ...	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
A ...	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
M ...	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
J....	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
J....	29.313	29.50	28.99	58.0	......	61.8	59.9	88	44	73.0	51.2	53	......	54	53	84	......	75	80	1.09	0.26
A ...	29.272	29.60	28.98	55.7	......	59.6	57.6	82	40	68.3	50.1	52	......	53	52	87	......	79	83	3.58	1.64
S.....	29.320	29.74	28.73	48.9	......	52.2	50.6	76	32	60.3	45.0	45	......	47	46	88	......	83	85	3.99	1.30
O....	29.232	29.66	28.70	37.5	......	41.0	39.2	60	22	46.9	34.7	34	......	37	35	88	......	85	86	2.37	0.49
N ...	29.401	29.99	28.91	28.6	......	31.9	30.2	56	1	36.4	25.5	25	......	27	26	87	......	82	84	3.60	1.36
D ...	29.246	29.71	28.70	21.5	......	25.0	23.2	42	-2	29.2	17.1	17	......	20	18	84	......	80	82	2.27	0.90
Y ...	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......

SAVANNAH, GA.

[Latitude, 32° 5′ N; longitude, 81° 5′ W.]

J	30.162	30.43	29.82	46.8	59.3	51.3	52.5	76	27	62.2	44.7	42	44	44	43	85	61	78	75	2.09	1.42
F....	30.015	30.43	29.66	50.2	61.2	54.2	55.2	72	27	64.5	46.4	48	47	49	48	91	63	84	80	3.42	1.10
M ...	30.046	30.43	29.59	50.1	63.6	55.6	56.4	78	32	67.0	47.3	44	44	46	45	82	52	72	69	2.24	0.86
A....	30.072	30.45	29.78	60.9	74.0	64.9	66.6	88	48	76.8	58.1	55	53	56	55	81	51	77	69	0.71	0.32
M ...	29.894	30.15	29.62	68.7	78.4	70.5	72.5	91	52	82.1	65.7	64	62	65	64	84	60	84	76	3.60	1.14
J.....	29.913	30.24	29.70	73.7	82.9	74.6	71.1	96	60	88.4	69.8	69	66	68	68	85	59	82	75	2.59	0.53
J.....	29.964	30.16	29.77	78.0	......	79.1	78.6	99	67	89.5	72.0	71	......	70	71	80	......	76	78	0.82	0.31
A....	29.984	30.12	29.84	77.8	......	79.2	78.5	97	64	88.4	72.9	73	......	73	73	85	......	82	84	7.83	1.63
S.....	29.942	30.19	29.61	71.9	......	73.4	72.6	92	48	81.4	67.9	67	......	68	68	85	......	84	84	10.34	1.98
O....	29.966	30.22	29.41	61.0	......	66.0	63.5	82	49	74.2	57.0	55	......	58	57	82	......	78	80	6.81	2.77
N ...	30.025	30.27	29.72	53.9	......	58.2	56.0	81	37	64.6	50.9	50	......	51	50	86	......	79	82	3.74	1.09
D ...	30.083	30.44	29.52	44.1	......	50.0	47.0	69	25	58.2	41.2	40	......	44	42	85	......	79	82	2.87	1.23
Y ...	30.006	30.45	29.41	61.4	......	64.8	64.7	99	25	74.8	58.0	56	......	58	57	84	......	80	78	47.06	......

Monthly and yearly meteorological summaries—Continued.

SAN FRANCISCO, CAL.

[*H*=60. *T*=70. *h*=69.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.9	6.4	6.1	6.1	5,263	40	NW.	SE.	12	14	4	26	11	6	3	15	2	8	7	16	0	16	0	3	0	1	0	J.
4.7	5.0	2.9	4.2	4,434	25	W.	W.	8	14	3	5	7	11	21	12	6	12	11	6	0	5	0	0	0	0	0	F.
4.9	5.4	3.9	4.7	6,085	36	SE.	W.	12	3	6	7	8	21	28	8	0	13	9	9	0	11	0	0	0	1	0	M.
3.9	2.6	3.8	3.4	7,030	36	W.	W.	4	1	3	1	4	25	38	7	7	13	13	4	0	2	0	0	0	0	0	A.
7.0	5.6	5.6	6.1	7,548	29	W.	W.	0	0	0	2	2	36	49	3	1	5	14	12	0	5	0	0	0	0	0	M.
4.0	4.3	4.6	4.3	8,597	35	W.	W.	0	0	0	0	3	16	65	3	3	12	10	8	0	8	0	0	0	0	0	J.
5.7	.....	2.4	4.0	8,664	35	W.	SW.	0	0	0	0	0	33	24	0	5	9	18	4	0	1	0	0	1	0	0	J.
5.4	.....	2.0	3.7	7,780	34	W.	SW.	0	0	1	0	1	36	21	0	3	13	16	2	0	0	0	0	0	0	0	A.
5.9	.....	3.2	4.6	6,958	34	W.	W.	1	0	1	0	2	19	29	2	6	10	16	4	0	2	0	0	0	2	0	S.
4.6	.....	3.4	4.0	5,726	32	N.	W.	4	0	0	1	4	20	23	2	8	14	14	3	2	2	0	0	0	0	0	O.
5.2	.....	5.7	5.4	3,937	26	SE.	W.	7	1	1	5	7	11	13	10	5	8	12	10	0	7	0	0	0	0	0	N.
7.1	.....	7.8	7.4	4,447	25	SE.	NW.	9	6	5	8	7	9	0	15	3	0	15	16	0	17	0	0	0	1	0	D.
5.4	.....	4.3	4.8	76,469	.....	....	W.	57	39	24	55	56	243	314	77	49	117	155	94	2	76	0	3	1	5	0	Y.

SANTE FÉ, N. MEX.

[*H*=7,026. *T*=35. *h*=29.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
3.2	4.0	2.4	3.2	4,875	30	N.†	NE.	23	24	4	5	6	12	9	5	5	16	14	1	0	3	8	26	0	0	0	J.
3.0	5.2	3.4	3.9	4,595	27	N.	N.	25	9	11	5	9	10	6	6	6	12	13	4	0	6	0	22	0	0	0	F.
3.6	4.7	3.0	3.8	4,619	30	SW.	SW.	12	14	14	7	9	16	8	11	2	15	11	5	0	10	1	23	0	0	0	M.
4.7	5.8	5.3	5.3	4,428	26	E.	E.	10	14	21	8	7	16	7	5	2	8	12	10	0	10	0	2	0	2	0	A.
2.2	5.6	3.9	3.9	5,211	33	W.	E.	16	14	17	11	9	8	9	7	2	11	17	3	0	5	0	0	0	1	0	M.
1.9	3.3	3.3	2.8	5,344	30	E.†	SW.	5	14	15	13	9	16	5	13	0	17	12	1	0	4	0	0	0	5	0	J.
2.6	.....	5.1	3.8	4,846	45	W.	E.	9	13	19	8	9	4	0	0	0	16	10	5	0	16	0	0	0	10	0	J.
2.5	.....	4.2	3.4	3,961	36	NW.	E.	8	9	14	12	3	4	4	3	5	20	9	2	0	9	0	0	0	5	0	A.
1.4	.....	3.3	2.4	2,867	24	N.	E.	2	12	14	9	2	5	0	1	15	24	6	0	0	4	0	0	0	1	0	S.
2.9	.....	3.9	3.4	4,547	28	W.	NE.†	13	13	10	7	4	6	2	6	1	20	5	6	0	5	0	4	0	0	0	O.
4.8	.....	5.4	5.1	3,385	26	NW.†	NE.	10	14	6	6	5	7	2	3	7	13	9	8	0	8	2	24	0	0	0	N.
3.1	.....	2.8	3.0	4,168	34	SE.	NE.†	20	20	5	4	1	4	2	0	6	24	1	6	0	6	1	30	0	0	0	D.
3.0	.....	3.8	3.7	52,846	.....	....	NE.	153	170	150	95	73	108	54	60	51	196	119	51	0	86	12	131	0	24	0	Y.

SAULT DE STE. MARIE, MICH.

[*H*=642. *T*=56. *h*=48.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	J.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	F.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	M.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	A.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	M.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	J.
4.9	.....	4.3	4.6	4,191	36	NW.	NW.	0	1	9	7	6	1	13	14	11	10	11	10	0	9	0	0	0	1	0	J.
5.8	.....	5.3	5.3	3,796	35	W.	NW.	6	1	3	7	1	2	7	13	22	10	12	9	0	11	0	0	0	7	0	A.
6.1	.....	5.9	6.0	4,441	28	E.	NW.	2	0	12	7	7	2	3	17	10	9	5	6	0	13	0	0	0	3	0	S.
7.5	.....	7.0	7.2	4,614	30	SE.	SE.†	7	4	8	11	11	0	3	10	8	6	5	20	0	16	0	8	0	0	0	O.
7.9	.....	7.5	7.7	4,510	28	W.	NW.	3	5	12	10	4	0	5	14	7	2	8	20	0	13	9	21	0	2	0	N.
8.6	.....	7.9	8.2	5,533	36	SW.	S.	10	6	4	3	13	7	5	10	4	3	7	21	0	14	19	29	0	0	0	D.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	Y.

SAVANNAH, GA.

[*H*=87. *T*=66. *h*=56.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
4.4	5.5	3.8	4.6	4,897	28	NE.	NW.	10	7	4	4	13	17	16	21	1	12	11	8	0	9	0	2	0	1	0	J.
5.9	6.6	5.4	5.9	4,550	24	E.†	W.	7	9	13	6	13	9	19	9	2	9	8	12	0	11	0	2	0	2	0	F.
5.3	4.1	2.8	4.0	6,067	36	NW.	S.	12	5	9	13	22	6	11	15	0	15	7	9	0	7	0	0	0	1	0	M.
4.2	3.7	2.5	3.5	5,999	28	E.	E.	6	11	21	8	16	10	11	7	0	15	12	3	0	4	0	0	0	3	0	A.
4.5	6.1	3.4	4.7	5,659	24	E.	S.	6	3	4	17	35	16	5	6	1	10	14	7	0	9	0	0	1	5	0	M.
4.2	5.3	3.1	4.2	4,520	28	NW.	S.	2	2	11	8	29	21	8	5	4	9	15	6	0	10	0	0	16	11	0	J.
3.9	.....	4.8	4.4	4,757	28	NW.	SE.	6	6	9	15	10	10	4	2	0	7	17	7	0	4	0	0	14	6	0	J.
4.6	.....	3.9	4.2	4,360	24	NW.	S.	7	9	6	11	18	7	3	1	0	9	14	8	0	16	0	0	11	8	0	A.
5.9	.....	4.9	5.4	4,596	30	SE.	S.	11	8	3	4	12	4	11	5	2	8	5	17	0	17	0	0	1	3	0	S.
4.6	.....	2.1	3.4	4,654	50	NE.	W.	6	10	6	3	9	4	12	9	3	17	5	9	0	8	0	0	0	0	0	O.
5.5	.....	3.8	4.6	5,553	32	NE.	N.	18	9	2	4	4	1	16	5	1	11	5	14	0	13	0	0	0	0	0	N.
3.4	.....	3.9	3.6	5,140	30	W.	NW.	8	5	7	3	4	0	9	22	4	17	1	13	0	9	0	4	0	0	0	D.
4.7	.....	3.7	4.4	60,752	.....	....	S.	99	84	95	96	185	105	125	107	18	139	114	113	0	117	0	8	43	40	0	Y.

Monthly and yearly meteorological summaries—Continued.

SHREVEPORT, LA.

[Latitude, 32 °30′ N.; longitude, 93° 40′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Means.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. in 24 hours.
	In.	*In.*	*In.*	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	*In.*	*In.*
J....	30.001	30.46	29.64	39.5	48.7	45.3	44.5	76	15	53.1	37.2	37	42	42	40	9[illegible]	78	88	85	3.75	1.16
F....	29.808	30.30	29.48	46.3	56.3	52.2	51.6	75	32	61.0	44.5	43	47	47	46	9[illegible]	74	84	83	2.01	0.43
M...	29.833	30.30	29.25	48.3	60.2	55.6	54.7	81	32	65.4	45.6	45	47	48	46	8[illegible]	65	77	76	9.00	2.13
A...	29.833	30.08	29.53	62.3	76.0	69.6	69.3	87	46	78.7	59.9	57	57	59	58	8[illegible]	54	71	69	4.49	2.04
M...	29.650	29.83	29.38	66.2	79.2	72.8	72.7	90	52	81.8	62.6	61	62	63	62	84	57	72	72	3.44	1.14
J.....	29.676	29.90	29.50	72.6	84.1	77.9	78.2	97	62	86.9	70.2	70	70	71	70	91	65	80	78	3.24	0.79
J.....	29.757	29.89	29.62	77.6	....	85.3	81.4	98	67	92.4	73.1	72	.....	73	72	83	.....	67	75	2.97	1.17
A...	29.720	29.92	29.47	76.1	....	83.6	79.8	97	69	91.3	72.3	72	.....	72	72	88	.....	70	79	3.76	0.90
S.. .	29.794	30.14	29.67	66.8	....	77.2	72.0	92	52	84.8	63.3	62	.....	64	63	85	.....	65	75	0.91	0.64
O...	29.781	30.07	29.57	58.5	....	68.3	63.4	87	44	75.6	55.7	55	.....	56	55	88	.....	67	77	2.73	1.40
N...	29.864	30.17	29.36	49.5	....	57.2	53.4	84	34	63.4	46.6	47	.....	48	47	90	.....	72	81	3.48	1.32
D...	29.900	30.24	29.44	43.4	....	53.7	48.6	74	26	58.8	40.6	39	.....	42	40	85	.....	66	76	4.98	1.76
Y...	29.805	30.46	29.25	58.9	....	66.6	64.1	98	15	74.4	56.0	55	.....	57	56	87	.....	73	77	44.76	....

FORT SILL, IND. T.

[Latitude, 38° 40′ N.; longitude, 98° 23′ W.]

J......	28.979	29.54	28.48	24.4	39.2	32.1	31.9	71	-7	45.6	21.7	20	26	25	24	84	62	76	74	.35	0.15
F.....	28.801	29.34	28.39	37.3	49.4	43.0	43.2	75	19	53.6	34.9	35	37	37	33	90	67	81	79	2.17	1.12
M....	28.814	29.39	28.17	36.0	55.7	46.1	45.9	86	20	60.2	33.9	32	40	37	36	86	59	73	73	1.10	0.49
A....	28.823	29.18	28.44	53.5	72.2	62.5	62.7	92	35	74.4	51.2	49	54	54	52	87	57	75	73	3.63	1.72
M....	28.649	28.93	28.37	58.2	74.9	66.8	66.6	90	45	77.6	55.2	54	58	58	57	87	57	76	73	3.01	2.16
J......	28.649	28.89	28.31	63.9	85.3	75.4	76.5	96	55	87.9	65.8	66	67	68	67	90	57	79	75	4.77	2.24
J.....	28.784	28.99	28.62	72.6	....	85.8	79.2	99	60	92.1	68.0	68	.....	68	68	84	.....	57	71	3.52	2.29
A....	28.743	28.95	28.48	72.4	....	83.4	77.9	105	60	91.2	67.6	67	.....	67	67	84	.....	61	73	9.73	3.82
S....	28.838	29.11	28.65	61.0	....	75.1	68.0	91	41	84.5	56.3	56	.....	58	57	84	.....	56	70	0.83	0.44
O.....	28.796	29.05	28.45	49.7	....	62.1	55.9	88	33	72.4	46.2	46	.....	50	48	87	.....	66	76	2.36	1.21
N	28.886	29.23	28.50	40.2	....	47.8	44.0	84	22	56.4	37.3	36	.....	40	38	85	.....	77	81	1.62	0.39
D....	28.882	29.25	28.37	35.8	....	45.4	40.6	69	20	55.2	33.7	32	.....	37	34	87	.....	73	80	2.63	0.94
Y....	28.8 4	29.54	28.17	50.8	....	60.5	57.7	105	-7	70.9	47.6	46	.....	50	49	86	.....	71	75	35.72	....

SPOKANE FALLS, WASH.

[Latitude, 47° 40′ N.; longitude, 117° 25′ W.]

J.....	28.067	28.71	27.53	12.0	18.2	16,3	15.5	52	-30	23.7	8.4	10	14	14	12	90	84	91	88	3.96	0.88
F....	28.057	28.38	27.50	32.7	42.7	39.6	38.3	58	22	48.0	30.3	30	33	34	32	92	70	83	81	0.64	0.27
M...	27.957	28.30	27.54	30.4	43.9	41.0	38.4	62	12	49.0	28.2	27	28	30	28	88	55	65	69	0.62	0.24
A....	28.032	28.39	27.59	40.4	58.6	55.5	51.5	80	27	63.6	38.2	35	36	39	37	82	44	56	60	0.39	0.22
M...	27.884	28.19	27.66	46.5	67.2	65.6	59.8	92	35	72.7	44.7	41	43	46	43	83	45	52	60	1.24	0.75
J	27.841	28.12	27.61	52.1	66.1	66.0	61.4	85	44	72.3	50.6	48	50	51	50	87	59	60	69	5.12	2.22
J	27.996	28.28	27.78	51.6	....	80.5	67.6	96	42	84.6	51.7	47	.....	48	48	77	.....	34	56	0.06	0.03
A....	27.976	28.11	27.77	56.4	....	85.3	70.8	102	48	88.0	54.7	46	.....	51	49	71	.....	32	52	0.07	0.06
S....	28.026	28.44	27.77	50.4	....	78.3	64.4	98	36	81.4	47.8	38	.....	37	38	65	....	21	45	0.03	0.03
O....	27.984	28.30	27.47	39.5	....	56.5	48.0	82	23	60.8	38.0	34	....	40	37	80	.....	57	69	1.57	0.55
N....	28.076	28.39	27.56	31.5	....	38.4	35.0	54	15	42.5	29.6	28	.....	32	30	89	.....	77	83	1.08	0.39
D....	28.050	28.59	27.60	30.7	....	35.6	33.2	50	14	38.7	28.3	28	.....	31	30	93	.....	85	89	2.91	0.72
Y....	27.996	28.75	27.47	39.8	....	54.9	48.7	102	-30	60.4	37.5	34	.....	38	36	83	.....	60	68	17.7	....

SPRINGFIELD, ILL.

[Latitude, 39° 48′ N.; longitude, 89° 39′ W.]

J.....	29.564	30.23	29.04	13.0	21.1	18.5	17.5	53	-17	27.0	8.8	8	13	13	12	82	70	79	77	3.03	1.64
F ...	29.399	30.12	28.70	22.7	31.2	28.1	27.3	54	-9	35.9	19.5	19	23	22	21	84	72	80	79	2.03	1.16
M ...	29.421	29.85	28.85	31.0	39.5	35.7	35.4	66	6	45.0	26.5	26	27	28	27	81	62	74	72	3.48	1.10
A....	29.461	29.84	28.92	44.9	61.9	53.4	53.4	80	30	65.7	41.5	35	37	37	36	70	43	56	56	1.41	0.65
M ...	29.249	29.57	28.89	52.2	65.8	58.4	58.8	85	35	69.1	49.1	47	47	49	48	83	54	73	70	8.61	2.56
J. ...	29.275	29.53	29.02	63.9	75.8	69.6	69.8	89	43	79.2	61.2	59	60	62	60	84	60	76	74	5.50	3.35
J	29.376	29.56	29.18	71.8	....	79.2	73.5	97	59	85.9	66.9	66	.....	68	67	82	.....	70	76	4.59	2.36
A....	29.372	29.64	29.13	65.8	....	73.8	69.8	95	48	80.9	62.0	61	.....	64	62	83	.....	72	78	1.43	0.43
S. ...	29.412	29.75	29.07	55.1	....	65.2	60.2	89	36	74.3	51.7	49	.....	53	51	79	.....	65	72	1.70	0.77
O....	29.336	29.66	28.99	43.8	....	53.1	48.4	77	32	60.2	41.6	40	.....	42	41	85	.....	66	76	3.61	1.67
N....	29.469	29.90	28.95	37.3	....	42.6	40.0	77	23	49.5	34.4	33	.....	35	31	86	.....	76	81	3.41	1.35
D....	29.452	29.78	28.91	31.2	....	35.0	33.1	55	16	41.0	27.5	26	.....	27	26	80	.....	74	77	1.99	0.68
Y ...	29.399	30.23	28.70	44.4	....	51.0	49.1	97	-17	59.5	40.9	39	.....	42	40	82	.....	72	74	40.79	....

Monthly and yearly meteorological summaries—Continued.

SHREVEPORT, LA.

[*H*=249. *T*=77. *h*=76.*]

Cloudiness (in tenths).				Wind.													Number of days.										
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder storms.	Auroras.	Months and year.
6.7	6.8	5.8	6.4	4,536	27	W.	S.	19	5	6	7	29	6	3	16	2	8	6	17	0	16	1	12	0	0	0	J.
6.8	6.8	5.0	6.2	4,587	24	N.†	S.	14	13	7	9	16	5	11	10	2	7	10	12	0	14	0	0	0	1	0	F.
5.5	5.5	5.3	5.4	5,773	30	S.†	S.	22	4	9	5	26	8	7	11	1	10	10	11	0	13	0	0	0	8	0	M.
6.6	5.9	3.0	5.2	5,115	27	S.	S.	4	6	11	12	31	9	6	8	3	8	13	9	0	9	0	0	0	5	0	A.
6.2	6.0	3.6	5.3	4,872	48	NW.	S.	3	7	7	6	40	6	6	10	8	10	10	11	0	12	0	0	0	8	0	M.
5.2	6.2	3.3	4.9	4,427	34	NW.	S.	2	7	12	20	31	7	5	5	1	9	17	4	0	16	0	0	5	6	0	J.
2.7	.....	4.5	3.6	3,112	42	SE.	S.	7	5	6	6	14	1	10	7	6	8	20	3	0	10	0	0	21	9	0	J.
4.6	.....	5.8	5.2	3,889	26	SE.	SE.	2	8	8	16	11	5	4	4	4	9	14	8	0	12	0	0	19	11	0	A.
3.4	....	2.9	3.2	3,316	24	NE.	NE.	12	21	5	2	7	0	2	8	3	15	12	3	0	5	0	0	5	1	0	S.
4.9	.....	2.7	3.8	4,314	30	NW.	S.	5	8	8	8	15	3	3	7	5	14	10	7	0	8	0	0	0	2	0	O.
6.5	.....	4.8	5.6	3,960	23	NW.	S.†	11	10	9	3	11	0	8	7	1	8	8	14	0	11	0	0	0	0	0	N.
4.4	.....	4.3	4.4	5,025	36	S.	NW.	3	6	4	8	15	3	4	19	0	16	5	10	0	8	0	4	0	1	0	D.
5.3	.....	4.2	4.9	52,926	.....	....	S.	104	100	92	102	246	53	69	112	36	122	135	109	0	134	1	16	50	52	0	Y.

*From January 1 to March 16, inclusive, the elevation was as follows: Barometer, 227 feet; thermometer, 33 feet, and rain-guage, 40 feet.

FORT SILL, IND. T.

[*H*=1,200. *T*=9. *h*=55.]

7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder storms.	Auroras.	Months and year.
4.0	4.6	3.3	4.0	8,337	48	SW.	N.	39	8	1	8	28	5	0	2	2	13	10	8	0	7	7	21	0	0	0	J.
4.2	6.5	4.3	5.0	7,251	50	N.	N.	43	5	2	3	22	2	0	0	10	9	13	7	0	10	2	11	0	0	0	F.
4.2	3.9	2.8	3.6	10,122	48	S.	S.	31	1	2	1	41	4	0	2	11	14	11	6	0	8	1	15	0	0	0	M,
4.6	5.4	2.4	4.2	9,375	48	S.	S.	31	6	3	10	33	2	0	1	4	15	8	7	0	10	0	0	1	4	0	A.
3.7	4.0	3.2	3.6	8,594	36	S.†	S.	32	2	3	8	40	1	1	4	2	9	19	3	0	7	0	0	0	3	0	M.
4.0	5.0	2.5	3.7	9,23	51	S.	S.	11	2	6	17	39	3	0	4	3	13	10	4	0	11	0	0	9	8	0	J.
1.4	.....	0.9	1.2	6,152	26	N.	S.	18	2	8	9	22	0	1	0	10	25	4	2	0	3	0	0	19	0	0	J.
3.2	.....	2.3	2.8	6,879	46	N.	S.	17	7	3	4	23	0	2	3	3	18	8	5	0	10	0	0	15	5	0	A.
1.9	.....	2.0	2.0	5,097	32	SW.	SE.	12	10	2	16	3	2	1	9	5	19	7	4	0	7	9	0	4	1	0	S.
2.6	.....	2.8	2.7	7,329	36	SW†	N.	15	4	2	11	9	3	0	11	7	16	3	12	0	6	0	0	0	0	0	O.
5.1	.....	4.9	5.0	6,322	40	N.	N.	31	2	0	3	9	1	0	4	10	12	6	12	0	10	0	11	0	1	0	N.
3.8	.....	3.3	3.6	5,941	38	S.	N.	26	2	1	1	11	0	0	4	17	17	7	7	0	7	0	13	0	1	0	D.
3.6	.....	2.9	3.4	90,630	.....	....	N.	298	51	33	91	280	23	5	44	84	180	106	77	0	96	10	71	48	23	0	Y.

SPOKANE FALLS, WASH.

[*H*=1,909. *T*=57. *h*=48.]

7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder storms.	Auroras.	Months and year.
6.9	7.0	6.1	6.7	2,174	24	NE.	NE.	0	32	2	10	0	25	1	6	17	8	5	18	0	17	21	26	0	0	1	J.
5.2	7.7	5.1	6.0	2,787	30	SW.	SW.	0	13	3	5	1	42	3	14	6	6	13	10	0	6	0	18	0	0	0	F.
5.4	8.2	6.3	6.7	4,127	24	SW.	SW.	0	19	5	14	3	38	1	9	4	5	13	13	0	10	0	21	0	0	0	M.
5.7	8.4	7.1	7.1	4,386	30	SW.	SW.	0	15	0	7	2	50	8	5	3	1	15	14	0	6	0	6	0	1	0	A.
4.5	7.0	4.6	5.4	3,632	28	SW.	NE.	4	29	3	10	7	26	5	4	5	8	12	11	0	6	0	0	2	1	0	M.
6.7	9.1	7.2	7.6	3,892	24	SW.	SW.	2	6	2	8	6	56	6	3	1	2	11	17	0	15	0	0	0	2	0	J.
2.9	.....	3.4	3.2	3,923	24	SW.	SW.	1	14	0	2	3	34	3	3	2	21	2	8	0	3	0	0	10	0	0	J.
3.3	.....	3.3	3.3	2,916	18	SW.†	SW.	0	17	2	3	3	22	6	2	7	17	9	5	0	2	0	0	13	0	1	A.
2.6	.....	3.6	3.1	2,363	18	SW.	SW.	2	13	1	2	2	20	3	6	11	18	8	4	0	1	0	0	3	0	0	S.
6.3	.....	6.1	6.2	3,050	30	SW.	SW.	1	10	3	3	4	20	8	3	10	3	15	13	0	13	0	6	0	0	0	O.
6.7	.....	6.5	6.6	2,358	20	SW.	SW.	0	18	6	0	2	21	1	6	6	5	6	19	1	11	0	14	0	0	0	N.
6.6	.....	6.8	6.7	2,337	16	SW.	NE.	0	22	4	8	6	12	3	4	3	4	2	25	1	16	7	24	0	0	0	D.
5.2	.....	5.5	5.7	37,945	.....	....	SW.	10	208	31	72	39	366	48	65	75	98	111	157	2	106	28	115	28	4	2	Y.

SPRINGFIELD, ILL.

[*H*=644. *T*=80. *h*=64.]

7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder storms.	Auroras.	Months and year.
4.4	5.2	4.7	4.8	6,847	40	W.	NW.	16	11	6	6	11	7	17	19	0	8	16	7	0	7	18	29	0	0	0	J.
4.9	6.2	4.8	5.3	5,956	33	W.	NW.†	15	8	10	4	16	5	11	16	2	6	14	9	0	6	7	25	0	0	0	F.
6.4	6.0	4.6	5.7	7,420	28	NW.†	S.	9	14	17	3	19	3	9	14	5	9	10	12	0	12	5	22	0	0	0	M.
5.0	5.1	2.6	4.2	6,721	36	W.†	S.	16	4	8	8	23	5	5	10	11	11	13	6	0	6	0	4	0	2	0	A.
5.8	6.3	4.5	5.6	5,158	36	SW.†	SE.	6	4	6	18	14	8	8	11	18	8	13	10	0	12	0	0	0	12	0	M.
6.3	7.0	4.9	6.1	4,568	32	S.†	S.	9	5	7	5	21	11	2	12	18	5	15	10	0	10	0	0	0	7	0	J.
4.6	.....	5.7	5.2	4,325	40	NW.	S.	10	2	8	6	13	8	6	3	6	8	17	6	0	7	0	0	7	7	0	J.
5.5	.....	4.6	5.0	4,884	30	S.	NE.	7	14	8	3	12	11	0	6	1	6	14	11	0	9	0	0	3	7	0	A.
3.3	.....	3.6	3.4	5,112	40	W.	NW.†	9	8	6	5	6	7	9	9	1	18	8	4	0	5	0	0	0	2	0	S.
4.7	.....	3.6	4.2	6,774	28	W.	S.	8	5	5	4	15	3	8	12	2	10	12	9	0	13	0	0	0	4	0	O.
6.8	.....	4.7	5.8	6,019	27	NE.	S.	10	12	6	2	13	2	3	11	1	8	8	14	0	10	0	14	0	2	0	N.
6.6	.....	5.0	5.8	7,486	36	W.	S.	6	2	2	2	17	9	8	13	3	8	9	14	0	7	2	22	0	0	0	D.
5.4	.....	4.4	5.2	71,270	.....	....	S.	121	89	89	66	180	79	86	136	68	105	149	112	0	104	32	116	10	43	0	Y

Monthly and yearly meteorological summaries—Continued.

SPRINGFIELD, MO.

[Latitude, 37° 12′ N.; longitude, 93° 18′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
	In.	*In.*	*In.*	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	*In.*	*In.*
J.....	28.765	29.30	28.22	22.5	32.3	27.6	27.5	68	-11	38.7	18.0	18	22	22	21	84	69	80	78	1.42	0.48
F ...	28.604	29.18	28.12	30.4	43.4	37.2	37.0	69	5	48.9	27.5	26	31	31	29	83	65	79	76	1.22	0.50
M ...	28.623	29.12	28.06	34.4	47.9	42.3	41.5	83	13	53.5	32,6	29	34	33	32	82	63	73	72	2.46	0.70
A ...	28.678	29.01	28.25	51.0	67.1	58.8	59.0	84	31	70.8	48.9	41	42	44	42	70	44	59	57	1.82	0.80
M ...	28.488	28.75	28.19	54.6	69.6	62.2	62.1	82	34	73.5	51.6	48	50	51	50	81	52	68	67	7.36	2.52
J......	28.532	28.77	28.31	64.6	78.5	69.7	70.9	92	50	81.9	62.0	60	63	62	62	86	60	78	74	6.11	2.20
J.....	28.640	28.81	28.52	73.0	....	81.9	77.4	99	62	89.3	68.7	66	.....	68	67	80	.....	63	72	0.50	0.38
A ...	28.614	28.87	28.39	68.2	....	75.6	71.9	97	54	82.9	65.5	64	.....	66	65	86	.. ..	75	81	7.97	3.20
S.....	28.670	29.03	28.48	57.9	....	67.6	62.8	89	40	76.4	55.5	53	.....	56	55	84	.....	69	76	1.89	1.61
O ...	28.602	28.84	28.33	46.3	....	55.6	51.0	82	33	64.3	44.1	42	.....	44	43	84	.....	68	76	5.07	1.35
N ...	28.683	29.02	28.17	38.2	....	43.4	40.8	79	27	50.4	36.0	34	.....	36	35	86	.....	78	82	3.78	1.58
D ...	28.675	28.99	28.19	32.9	....	39.1	36.0	60	18	45.3	31.0	28	.....	31	29	83	.....	74	78	2.52	1.47
Y ...	28.631	29.30	28.06	47.8	....	55.1	53.2	99	-11	64.7	45.1	42	.....	45	44	82	.....	72	74	42.12	....

FORT STANTON, N. MEX.

[Latitude, 33° 30′ N.; longitude, 105° 26′ W.]

J	23.946	24.37	23.67	27.4	45.9	35.5	36.3	62	-3	48.2	23.5	16	21	19	19	64	42	55	54	0.22	0.12
F....	23.880	24.27	23.66	23.3	46.9	38.9	38.0	65	16	49.4	27.3	17	23	24	21	63	42	58	54	1.09	0.66
M ...	23.874	24.25	23.45	28.0	48.4	40.3	38.9	66	10	52.1	26.6	12	12	17	14	52	31	42	42	2.82	1.30
A ...	23.988	24.24	23.74	42.6	62.2	53.4	52.8	74	31	65.6	39.1	21	22	31	26	50	27	46	41	1.69	0.82
M ...	23.889	24.07	23.68	44.2	67.0	58.6	56.6	80	33	70.3	41.2	19	17	24	20	38	18	32	29	0.25	0.21
J.....	23.926	24.09	23.75	55.4	78.7	69.6	67.9	92	43	82.4	50.9	28	32	37	32	36	23	34	31	0.88	0.38
J.....	24.076	24.26	23.95	61.0	....	76.6	68.8	89	51	81.8	55.6	47	.....	47	47	60	.....	38	49	1.60	0.50
A ...	24.062	24.30	23.91	56.4	....	73.6	65.0	90	48	79.8	52.4	40	.....	46	43	55	.....	44	49	4.51	1.80
S.....	24.086	24.22	23.95	47.6	....	66.5	57.0	80	38	73.1	46.0	28	.....	40	34	47	.....	40	44	1.16	0.64
O....	23.981	24.17	23.78	40.4	....	58.5	49.4	78	29	65.5	38.2	22	.....	34	28	51	.....	44	47	2.14	1.57
N ...	23.970	24.18	23.74	32.1	....	43.0	37.6	70	18	51.0	28.9	20	.....	25	23	65	.....	54	60	1.53	0.60
D ...	23.989	24.25	23.72	28.2	....	38.5	33.4	58	3	47.3	23.1	20	.....	22	21	72	.....	52	62	0.15	0.08
Y ...	23.972	24.37	23.45	41.0	....	54.4	50.1	92	-3	63.9	37.7	25	.....	31	27	54	.....	45	47	18.0	....

ST. LOUIS, MO.

[Latitude, 38° 38′ N.; longitude, 90° 12′ W.]

J	29.632	30.26	29.13	20.3	27.6	25.0	24.3	68	-12	34.1	16.2	15	19	18	17	80	71	75	75	2.15	0.73
F....	29.462	30.15	28.83	27.4	36.0	33.1	32.2	63	-4	41.7	24.4	23	26	26	25	84	70	77	77	2.39	1.36
M ...	29.472	29.91	28.91	35.9	44.8	41.7	40.8	76	14	50.8	31.1	30	29	33	31	81	59	72	71	3.79	1.66
A ...	29.513	29.89	28.96	50.6	66.3	59.1	58.7	88	35	70.5	48.4	39	39	40	40	67	40	52	53	1.88	1.33
M ...	29.304	29.58	28.98	57.2	69.1	62.9	63.1	88	40	72.6	53.7	50	50	50	50	78	53	65	66	3.81	1.05
J.....	29.331	29.56	29.06	67.4	79.0	73.2	73.2	90	50	82.4	65.0	61	63	63	62	80	59	72	70	8.09	4.64
J.....	29.424	29.60	29.27	74.7	....	83.4	79.0	98	64	88.6	71.0	66	.....	67	66	76	.....	58	67	2.09	1.49
A ...	29.422	29.68	29.17	70.1	....	76.3	73.2	97	56	82.7	66.8	64	.....	64	64	80	.....	67	74	6.66	2.64
S.....	29.472	29.82	29.18	59.7	....	69.3	64.5	90	43	76.3	57.0	53	... .	55	54	78	.....	62	70	1.31	1.14
O....	29.410	29.71	29.11	48.3	....	57.0	52.6	85	36	64.7	45.3	41	.....	44	43	78	.....	64	71	2.59	0.76
N ...	29.532	29.93	29.01	40.8	....	46.3	43.6	79	28	51.7	38.0	36	.....	37	36	83	.....	72	77	4.40	1.35
D ...	29.523	29.84	28.96	34.1	....	39.2	36.6	59	21	45.2	31.2	29	.....	30	29	81	.....	71	76	2.01	0.89
Y ...	29.458	30.26	28.83	48.9	....	55.5	53.5	98	-12	63.4	45.7	42	.....	44	43	79	.....	67	71	41.2	....

ST. PAUL, MINN.

[Latitude, 44° 58′ N.; longitude, 93° 3′ W.]

J. ...	29.298	29.81	28.54	-5.6	2.8	0.0	-0.9	34	-41	9.5	-10.2	-10	-4	-5	-6	81	74	81	79	0.72	0.23
F ...	29.102	29.91	28.64	7.8	17.0	12.4	12.4	45	-33	23.9	2.5	4	11	8	8	83	77	84	81	0.64	0.25
M ...	29.192	29.72	28.56	12.3	22.8	19.5	18.2	42	-14	28.2	9.4	9	1	15	13	87	75	84	82	1.11	0.39
A....	29.203	29.63	28.60	34.8	45.9	40.8	40.5	76	23	50.6	32.6	29	36	35	33	81	70	79	77	5.14	1.58
M ...	28.997	29.43	28.61	44.7	53.7	50.9	49.8	78	29	57.7	42.6	40	45	44	44	86	75	80	80	4.75	1.23
J. ...	28.963	29.30	28.62	60.6	73.0	67.5	67.0	89	41	76.3	57.4	54	59	58	57	81	63	71	72	1.95	0.52
J. ...	29.100	29.30	28.79	67.2	....	76.8	72.0	94	56	82.6	63.6	62	.....	65	63	83	.....	67	75	5.55	2.06
A....	29.106	29.42	28.77	60.3	....	71.1	65.7	94	46	77.3	57.6	57	.....	60	58	88	.....	68	78	2.23	0.68
S. ...	29.148	29.49	28.63	49.8	....	60.7	55.2	81	31	67.7	48.2	46	.....	51	48	86	.....	72	79	1.70	0.88
O.....	29.044	29.36	28.63	38.7	....	47.5	43.1	75	28	53.2	37.2	35	.....	40	37	87	.. ..	76	81	1.10	0.77
N ...	29.209	29.69	28.80	29.2	....	36.2	32.7	66	6	44.4	27.7	26	.....	29	27	88	. ...	76	82	0.34	0.27
D ...	29.115	29.51	28.65	20.9	....	26.2	23.6	58	5	32.5	17.2	17	.....	20	19	86	.....	80	83	0.63	0.47
Y ...	29.123	29.91	28.54	35.1	....	42.5	39.9	94	-41	50.3	32.2	31	.....	35	34	85	.....	76	79	25.86	....

Monthly and yearly meteorological summaries—**Continued.**

SPRINGFIELD, MO.

[*H*=1,356. *T*=77. *h*=74.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
4.5	5.3	3.8	4.5	8,172	36	N.	SE.	8	14	4	17	11	15	8	16	0	14	7	10	0	13	11	26	0	0	0	J.
5.3	5.8	4.7	5.3	7,380	36	NW.†	NW.	5	16	9	16	11	7	6	17	0	8	12	9	0	13	3	18	0	1	0	F.
5.6	6.0	4.9	5.5	8,881	40	SE.	S.	9	9	5	17	18	10	8	17	0	10	10	11	0	14	2	19	0	4	0	M.
3.8	4.5	2.4	3.6	8,640	36	S.	SE.	8	15	8	24	8	11	9	7	0	14	12	4	0	7	0	1	0	3	0	A.
4.4	5.6	3.4	4.5	7,397	50	SW.	SE.	6	11	9	28	15	5	10	8	1	12	11	8	0	10	0	0	0	13	0	M.
5.0	5.5	2.8	4.4	6,370	54	SE.	SE.	6	5	8	26	19	11	8	6	1	9	16	5	0	13	0	0	1	13	0	J.
3.8	.....	3.5	3.6	5,050	24	SW.	SW.	5	8	4	14	8	19	1	1	2	13	14	4	0	6	0	0	14	9	0	J.
6.0	.....	5.1	5.6	5,903	48	N.	SE.	7	10	14	21	5	2	1	2	0	8	12	11	0	17	0	0	5	15	0	A.
2.5	.....	2.1	2.3	5,174	24	NW.	SE.†	6	11	11	10	11	2	4	4	1	18	11	1	0	5	0	0	0	3	0	S.
4.0	.....	3.1	3.6	7,399	36	NW.†	SE.	10	3	5	15	7	7	8	6	1	14	10	7	0	9	0	0	0	7	0	O.
6.5	.....	5.7	6.1	6,331	36	N.†	NE.	7	13	9	11	4	1	4	8	3	7	6	17	0	10	0	13	0	2	0	N.
5.9	.....	3.9	4.9	7,668	36	W.†	SE.	6	3	6	16	11	1	6	13	0	10	7	14	0	6	4	20	0	0	0	D.
4.8	.....	3.8	4.5	84,365	.....	....	SE.	83	118	92	215	128	91	73	105	9	137	128	101	0	123	20	97	20	70	0	Y.

FORT STANTON, N. MEX.

[*H*=6,154. *T*=23. *h*=1.]

3.1	2.5	2.5	2.7	6,417	46	SW.	NW.	7	0	4	6	1	7	17	34	17	21	5	5	0	3	3	24	0	0	0	J.
3.6	4.6	4.1	4.1	6,400	48	NW.	NW.	4	2	2	6	8	10	8	42	5	12	12	5	0	6	0	22	0	2	0	F.
3.4	3.6	2.8	3.3	6,106	42	W.	NW.	5	2	8	9	9	14	16	30	0	17	10	4	0	5	1	21	0	0	0	M.
3.0	5.2	3.2	3.8	4,958	30	SW.†	W.	1	2	6	13	12	13	25	16	2	13	13	4	0	8	0	1	0	8	0	A.
2.7	4.0	2.8	3.1	6,113	42	W.	W.	4	3	7	2	9	19	32	10	7	18	10	3	0	3	0	0	0	8	0	M.
2.3	3.4	3.0	2.9	4,658	42	E.	W.	8	2	14	3	16	8	23	11	5	18	9	3	0	6	0	0	1	11	0	J.
1.7	.....	4.0	2.8	4,120	30	NE.†	W.†	4	2	4	5	17	6	17	1	6	10	14	7	0	11	0	0	0	14	0	J.
2.4	.....	4.3	3.4	4,172	36	N.	W.†	5	3	5	3	15	7	23	1	0	13	10	8	0	13	0	0	0	0	0	A.
2.7	.....	2.7	2.7	3,541	30	S.	S.	1	1	4	6	19	3	17	2	7	14	9	7	0	4	0	0	0	1	0	S.
1.8	.....	3.4	2.6	4,618	28	W.	W.	2	2	5	1	14	3	18	14	3	21	3	7	0	4	0	6	0	0	0	O.
5.6	.....	5.0	5.3	4,519	40	W.	W.	3	0	2	5	9	3	19	11	8	7	11	12	0	7	1	19	0	0	0	N.
2.3	.....	2.7	2.5	5,518	38	W.	W.	4	0	5	1	4	5	28	13	2	19	11	1	0	3	1	29	0	0	0	D.
2.9	.....	3.4	3.3	61,140	.....	....	W.	48	19	66	60	133	98	243	185	62	183	117	66	0	73	6	122	1	44	0	Y.

ST. LOUIS, MO.

[H=571. T=107. *h*=99.]

4.1	5.5	4.0	4.5	8,800	52	SW.	NW.	17	7	5	10	9	6	14	23	2	13	11	7	0	9	15	26	0	0	0	J.
5.8	5.8	4.4	5.3	7,273	48	SW.	S.	9	12	7	6	14	6	12	12	9	9	9	11	0	9	7	19	0	1	0	F.
6.0	5.8	5.0	5.6	9,663	48	W.	N.	17	12	6	13	16	5	8	16	0	11	6	14	0	11	1	19	0	0	0	M.
3.6	3.6	1.4	2.9	9,370	44	S.	SE.	18	9	8	19	16	2	7	7	4	18	8	4	0	4	0	0	0	0	0	A.
5.4	5.5	3.1	4.7	8,862	46	S.	SE.	3	10	6	21	12	8	18	15	0	7	17	7	0	12	0	0	0	5	0	M.
5.8	6.0	3.2	5.0	6,955	42	W.	S.	7	6	14	19	22	3	7	9	3	8	17	5	0	14	0	0	0	3	0	J.
3.8	.....	4.1	4.0	5,902	36	NE.†	E.†	9	5	12	6	8	7	12	1	2	11	11	9	0	11	0	0	10	3	0	J.
6.7	.....	4.7	5.7	6,090	51	SW.	NE.	4	16	15	6	8	7	3	3	0	8	8	15	0	12	0	0	4	1	0	A.
2.9	.....	2.0	2.4	6,224	36	NW.	N.	13	11	7	1	7	7	6	7	1	14	11	5	0	5	0	0	0	1	0	S.
4.7	.....	3.1	3.9	8,107	36	NW.†	S.	12	3	7	5	13	4	11	5	2	14	7	10	0	9	0	0	0	1	0	O.
6.0	.....	5.1	5.6	6,465	38	NW.	N.	14	5	8	5	10	5	8	3	2	8	8	14	0	9	0	8	0	1	0	N.
4.6	.....	4.5	4.6	7,837	50	W.	W.	6	3	2	9	11	8	14	8	1	13	6	12	0	7	0	20	0	0	0	D.
5.0	.....	3.7	4.5	91,548	.....	....	S.	129	99	97	120	146	68	120	109	26	134	119	113	0	112	23	92	14	16	0	Y.

ST. PAUL, MINN.

[*H*=831. *T*=114. *h*=108.]

3.9	5.7	6.6	5.4	3,618	25	SE.†	W.	1	4	19	8	3	5	21	16	16	6	16	9	0	10	29	31	0	0	1	J.
5.5	6.4	6.8	6.2	4,743	28	W.	W.	1	2	13	16	6	7	23	12	7	5	13	11	0	12	15	29	0	0	1	F.
5.6	6.2	6.7	6.5	6,159	36	NW.	W.	2	14	17	5	3	6	22	16	8	3	15	13	0	9	20	31	0	0	0	M.
7.1	5.6	5.3	5.3	5,710	40	E.	NW.†	11	5	19	13	4	2	10	19	7	6	15	9	0	11	0	16	0	4	3	A.
6.6	7.3	6.4	7.1	4,644	26	W.†	NW.	5	12	11	13	4	3	13	19	13	5	7	19	0	19	0	3	0	2	0	M.
5.1	6.2	6.1	6.2	4,063	36	W.	SE.	3	7	6	25	8	8	8	4	21	4	10	16	0	10	0	0	0	5	1	J.
4.4	.....	4.6	5.0	2,754	56	W.	SW.	2	2	6	9	2	11	8	10	12	6	16	9	0	12	0	0	1	9	0	J.
5.6	.....	3.7	4.2	2,769	28	W.	SE.	1	3	3	12	6	4	11	7	15	6	21	4	0	11	0	0	2	3	1	A.
6.1	.....	4.4	4.8	4,047	28	SW.	E.	4	1	11	8	0	6	10	8	12	8	15	7	0	8	0	1	0	2	0	S.
5.1	.....	5.9	6.0	5,150	26	W.	SE.	5	3	11	12	2	9	9	9	2	4	14	13	0	9	0	6	0	1	0	O.
.8	.....	3.7	4.8	4,564	24	S.	SE.	2	0	10	14	3	5	9	13	4	9	16	5	0	4	3	21	0	1	0	N.
5.6	.....	4.9	5.2	5,297	26	NW.	NW.†	0	1	4	10	9	7	14	14	3	9	13	9	0	4	16	30	0	0	0	D.
5.6	.....	5.4	5.6	53,518	.....	....	W.	37	54	130	145	50	73	158	147	120	71	171	124	0	119	83	168	3	27	7	Y.

Monthly and yearly meteorological summaries—Continued.

ST. VINCENT, MINN.

[Latitude, 48° 56′ N.; longitude, 97° 14′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
	Mean.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	Maximum.	Minimum.	Mean.		7 a.m.	3 p.m.	10 p.m.	Mean.	7 a.m.	3 p.m.	10 p.m.	Mean.	Total.	Max. in 24 hours.
										Maximum.	Minimum.										
	In.	*In.*	*In.*	°	°	°	°	°	°	°	°	°	°	°	°					*In.*	*In.*
J.....	29.332	29.69	28.77	-17.7	- 8.3	-14.4	-13.5	36	-54	-3.2	-24.3	-21	-13	-18	-18	88	78	86	84	0.71	0.47
F....	29.175	29.95	28.75	- 4.0	3.9	- 0.2	- 0.1	39	-50	11.6	-10.3	- 6	- 1	- 3	- 3	90	81	88	86	0.22	0.12
M...	29.281	29.84	28.46	0.4	14.2	8.7	7.8	41	-29	19.1	- 4.0	- 2	10	6	4	89	82	87	86	0.93	0.45
A ...	29.223	29.78	28.57	28.3	42.4	33.7	34.8	77	6	45.2	24.3	24	31	28	27	84	65	79	76	1.06	0.32
M...	29.086	29.53	28.46	36.4	56.5	46.6	46.5	77	14	59.1	30.8	28	31	32	30	71	42	60	58	0.28	0.10
J.....	28.920	29.33	28.37	55.6	69.6	63.3	62.8	91	25	73.3	50.5	49	55	54	53	80	62	74	72	7.37	*1.90
J.....	29.094	29.34	28.62	62.0	....	71.1	66.5	89	45	77.0	54.9	57	.....	61	59	85	.....	71	78	2.76	0.89
A ...	29.102	29.43	28.75	53.6	....	66.9	60.2	96	30	74.3	47.2	49	.....	54	51	84	....	64	74	0.52	0.39
S.....	29.126	29.52	28.69	46.2	....	57.8	52.0	84	24	67.4	41.7	41	.....	46	43	83	.....	65	74	1.22	0.50
O....	29.051	29.45	28.48	34.2	....	42.5	38.4	76	19	50.4	31.9	30	.....	34	32	86	.....	74	80	1.32	0.60
N ...	29.210	29.78	28.71	20.6	....	26.5	23.6	50	- 7	33.2	16.9	17	.....	21	19	87	.....	81	84	0.30	0.22
D ...	29.118	29.51	28.67	11.5	....	15.8	13.6	43	-16	25.0	5.7	9	.....	12	10	88	.....	83	85	0.53	0.30
Y ...	29.143	29.95	28.37	27.3	....	34.9	32.7	96	-54	44.4	22.1	23	.....	27	26	85	.....	76	78	17.22	....

*Estimated.

FORT SULLY, DAK.

[Latitude, 44° 39′ N.; longitude, 100° 39′ W.]

J.....	28.450	28.92	27.83	- 4.0	5.9	2.7	1.5	50	-32	13.7	- 9.1	- 8	- 2	- 2	- 4	84	71	82	79	0.37	0.18
F....	28.314	29.00	27.84	13.6	21.9	18.0	17.8	57	-20	29.1	8.5	9	13	13	12	81	68	81	77	0.35	0.18
M...	28.361	28.84	27.71	13.6	27.0	21.0	20.5	60	-13	30.8	11.0	8	15	13	12	80	62	72	72	0.49	0.23
A....	28.344	28.85	27.64	39.0	60.2	49.8	49.7	83	22	63.0	36.2	30	34	34	33	72	40	57	56	0.53	0.21
M ...	28.228	28.64	27.88	43.6	59.9	53.5	52.3	74	30	64.0	41.9	38	40	40	39	81	50	62	64	2.63	0.64
J.....	28.079	28.48	27.54	59.0	75.5	67.5	67.3	99	38	79.6	56.0	53	55	55	55	81	52	67	66	3.73	1.28
J.....	28.286	28.53	27.99	67.3	....	81.6	74.4	104	52	88.2	62.7	59	.....	58	59	76	.....	47	62	3.47	0.97
A.....	28.316	28.62	28.02	60.8	....	75.0	67.9	97	45	80.8	57.5	55	.....	57	56	81	.....	56	68	2.50	1.11
S.....	28.346	28.65	27.93	50.2	....	69.3	59.8	95	30	77.4	47.5	40	.....	39	40	70	.....	34	52	0.12	0.12
O....	28.266	28.56	27.73	36.2	....	50.5	43.4	79	18	59.9	34.3	28	.....	29	28	72	.....	45	59	0.21	0.16
N ...	28.376	28.82	27.98	22.3	....	36.1	29.2	66	2	46.5	20.5	16	.....	21	18	77	.....	56	67	0.11	0.09
D ...	28.324	28.78	27.83	18.4	....	29.1	23.8	67	- 6	36.1	15.5	13	.....	18	15	79	.....	66	72	0.26	0.10
Y ...	28.308	29.00	27.54	35.0	....	46.2	42.3	104	-32	55.8	31.9	28	.....	31	30	78	.....	60	66	14.77	....

TATOOSH ISLAND, WASH.

[Latitude, 48° 23′ N.; longitude, 124° 44′ W.]

J ...	29.884	30.61	29.25	35.9	36.9	36.3	36.4	55	14	40.0	31.8	32	33	32	32	87	86	84	86	12.10	2.65
F ...	30.015	30.46	28.99	42.5	43.9	43.1	43.2	51	35	46.2	40.6	40	41	41	41	92	90	92	92	5.42	1.27
M ...	29.901	30.31	29.44	42.0	44.3	43.3	43.2	51	31	46.9	39.4	38	38	38	38	85	80	84	83	8.45	2.64
A ...	30.004	30.26	29.52	44.9	47.8	46.9	46.5	60	34	51.6	43.3	43	44	43	44	93	88	88	90	5.92	1.10
M...	29.907	30.14	29.61	48.5	51.0	50.0	49.8	72	42	55.6	46.2	45	46	46	46	88	86	85	86	1.63	1.11
J ...	29.780	30.14	29.26	53.5	55.9	55.8	55.1	63	47	59.5	51.8	51	52	52	52	90	87	88	88	7.44	2.15
J ...	29.980	30.30	29.67	54.0	....	57.9	56.0	69	49	61.2	52.3	51	.....	53	52	90	.....	84	87	3.44	1.28
A ...	29.956	30.19	29.68	54.4	....	58.4	56.4	71	48	60.9	52.8	54	.....	55	54	97	.....	90	93	1.10	0.38
S ...	29.926	30.31	29.65	54.5	....	57.2	55.8	70	48	60.9	51.9	52	.....	54	53	93	.....	89	91	3.52	0.78
O ...	29.883	30.28	29.48	51.5	....	52.8	52.2	63	42	56.5	48.9	50	.....	50	50	94	....	91	93	12.12	2.74
N ...	29.908	30.28	29.55	41.3	....	47.6	47.0	56	36	50.9	43.7	44	.....	41	44	90	.....	88	89	10.76	1.41
D ...	29.801	30.25	29.20	47.5	....	47.6	47.6	59	38	51.0	44.7	43	.....	43	43	84	.....	85	85	11.82	2.22
Y....	29.912	30.61	28.99	48.0	....	49.7	49.1	72	14	53.4	45.6	45	.....	46	46	90	.....	87	89	83.72	....

TITUSVILLE, FLA.

[Latitude, 28° 34′ N.; longitude, 80° 51′ W.]

J.....	30.241	30.38	30.00	57.6	68.5	61.3	62.5	80	36	70.3	54.0	54	56	55	55	87	66	81	78	0.74	0.26
F....	30.107	30.44	29.87	59.6	68.3	63.1	63.7	81	38	70.8	56.3	57	58	59	58	92	72	86	83	7.11	2.08
M...	30.147	30.45	29.83	59.0	68.9	62.3	63.4	87	41	70.6	55.9	55	58	57	57	87	70	84	80	2.16	1.25
A ...	30.163	30.42	29.93	66.9	77.4	70.4	71.6	87	56	79.0	62.6	62	64	64	64	86	64	82	77	2.59	1.78
M...	29.999	30.20	29.73	72.5	79.4	74.0	75.3	88	62	81.6	67.1	69	69	69	69	88	72	86	82	2.92	1.22
J.....	30.027	30.26	29.85	75.9	83.0	77.2	78.7	93	60	85.8	69.8	72	71	71	71	87	68	83	79	6.56	2.70
J.....	30.052	30.19	29.92	81.2	....	80.5	80.8	95	68	87.8	73.6	74	.....	74	74	79	.....	79	79	5.62	2.96
A ...	30.068	30.17	29.94	81.9	....	81.6	81.8	91	69	87.5	73.8	75	.....	75	75	81	.....	81	81	4.40	1.02
S.....	29.989	30.15	29.74	78.5	....	78.3	78.4	90	58	83.9	72.1	74	.....	73	73	85	.....	84	85	6.35	1.70
O....	30.044	30.25	29.64	71.3	....	73.7	72.5	88	53	80.4	65.0	67	.....	68	67	86	.....	82	84	3.75	1.08
N ...	30.066	30.26	29.86	65.1	....	66.1	65.6	84	39	73.0	59.4	62	.....	61	61	88	.....	85	87	8.68	4.08
D ...	30.157	30.40	29.67	55.3	....	58.1	56.7	75	32	65.2	50.1	51	.....	53	52	86	.....	84	85	9.08	5.28
Y ...	30.088	30.45	29.64	68.7	....	70.6	70.9	95	32	78.0	63.3	64	.....	65	65	86	.....	83	82	59.96	....

Monthly and yearly meteorological summaries—**Continued.**

ST. VINCENT, MINN.

[H=804. T=16. h=15.]

Cloudiness (in tenths).				Wind.													Number of days.										
7 a.m.	3 p.m.	10 p.m.	Mean.	Total movement in miles.	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder storms.	Auroras.	Months and year.
2.7	3.3	2.1	2.7	7,554	48	NW.†	S.	22	1	2	6	36	3	11	12	0	17	13	1	0	2	30	31	0	0	8	J.
4.3	6.4	3.4	4.7	8,708	48	S.	S.	15	2	0	5	30	3	5	27	0	8	16	5	0	6	20	29	0	0	4	F.
4.3	5.3	3.0	4.2	7,553	54	NW.	NW.	10	6	8	5	22	1	5	26	10	12	14	5	0	9	29	31	0	0	4	M.
6.2	5.9	2.6	4.9	9,141	40	S.†	S.	18	6	4	15	23	1	14	9	0	9	15	6	0	9	23	24	0	0	10	A.
4.0	5.5	3.2	4.2	7,574	42	W.	N.	33	12	9	4	10	3	7	15	0	12	13	6	0	3	0	15	0	0	8	M.
4.5	5.6	4.9	5.0	7,630	44	S.	S.	20	9	10	14	28	4	1	3	1	11	9	10	0	14	0	2	1	12	2	J.
5.0	.....	3.7	4.4	5,526	29	NW.†	S.	12	5	3	7	14	7	8	5	1	13	8	10	0	9	0	0	0	9	0	J.
3.0	.....	4.1	3.6	5,593	34	NW.	S.	14	2	1	1	15	5	10	12	2	15	10	6	0	6	0	2	1	2	4	A.
3.9	.....	3.8	3.8	6,731	34	NW.	S.	3	2	5	6	15	3	10	13	3	8	9	13	0	9	0	5	0	3	4	S.
5.7	.....	5.1	5.4	6,458	30	SW.	S.	13	1	3	4	19	4	7	10	1	8	7	16	0	8	1	15	0	0	6	O.
5.6	.....	3.9	4.8	5,623	30	S.	S.	8	2	3	4	21	3	8	10	1	9	8	13	0	6	12	30	0	0	5	N.
5.0	.....	3.7	4.4	7,068	36	S.†	S.	11	0	2	5	20	3	6	15	0	11	11	9	...	4	23	31	0	0	6	D.
4.5	.....	3.6	4.3	85,159	.....	....	S.	179	48	50	76	253	40	92	157	19	133	133	100	0	85	118	215	2	26	61	Y.

FORT SULLY, DAK.

[H=1,600. T=15. h=2.]

Cloudiness (in tenths).				Wind.													Number of days.										
7 a.m.	3 p.m.	10 p.m.	Mean.	Total movement in miles.	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder storms.	Auroras.	Months and year.
3.8	4.4	3.2	3.8	6,062	54	W.	W.	2	3	14	1	0	0	50	1	22	15	10	6	0	5	25	31	0	0	0	J.
4.1	6.0	5.6	5.2	5,841	41	W.	W.	6	7	18	1	0	0	32	7	16	7	16	6	0	8	15	29	0	0	2	F.
4.9	5.5	3.3	4.6	7,623	36	NW.	NW.	5	6	21	12	1	0	14	26	8	9	16	6	0	7	17	28	0	0	0	M.
4.1	3.6	3.0	3.5	8,007	47	NW.	SE.	14	4	13	22	6	2	2	20	7	12	15	3	0	8	0	11	0	3	3	A.
6.2	5.6	4.8	5.6	7,670	45	E.	NW.	13	18	16	12	1	0	0	27	6	6	17	8	0	13	0	2	0	1	0	M.
4.9	4.8	4.0	4.6	9,669	50	W.	SE.	6	5	12	29	6	1	11	17	3	12	11	7	0	12	0	0	7	7	0	J.
3.5	.....	3.1	3.3	6,623	36	NE.†	E.	7	10	15	9	5	0	0	13	3	16	12	3	0	12	0	0	11	14	0	J.
4.1	.....	4.2	4.2	5,012	48	NW.	E.	13	3	18	5	3	0	5	7	8	14	8	9	0	11	0	0	7	5	0	A.
1.9	....	1.6	1.8	6,654	44	NW.	NW.	4	1	12	11	2	0	3	21	6	22	7	1	0	1	0	1	3	1	0	S.
3.0	.....	2.6	2.8	6,362	42	W.	NW.	5	4	10	5	2	0	7	20	9	13	14	4	0	3	0	10	0	0	0	O.
2.9	.....	1.7	2.3	4,097	36	NW.	NW.	5	0	8	8	1	1	2	25	10	19	3	8	0	3	3	27	0	0	1	N.
3.4	.....	3.8	3.6	5,384	36	NW.	NW.	4	2	5	10	0	2	4	27	8	19	6	6	0	4	14	28	0	0	2	D.
3.9	.....	3.4	3.8	79,004	.....	....	NW.	84	63	162	125	27	6	130	211	106	164	135	67	0	87	74	167	28	31	8	Y.

TATOOSH ISLAND, WASH.

[H=86. T=12. h=1.]

Cloudiness (in tenths).				Wind.													Number of days.										
7 a.m.	3 p.m.	10 p.m.	Mean.	Total movement in miles.	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder storms.	Auroras.	Months and year.
7.2	8.3	7.5	7.7	14,407	56	NW.	E.	2	7	43	16	7	8	4	4	2	3	11	17	0	19	7	16	0	0	0	J.
7.6	8.9	7.7	8.1	8,644	60	SE.	E.	0	0	42	13	5	9	10	7	1	3	6	20	0	22	0	0	0	0	0	F.
7.1	6.9	6.9	7.0	10,682	56	E.	E.	2	2	35	24	3	3	14	10	0	5	6	20	0	17	0	2	0	0	0	M.
7.5	8.5	7.7	7.9	9,055	45	W.	SW.	1	1	16	11	13	29	10	9	0	0	11	19	0	23	0	0	0	0	0	A.
6.3	6.0	6.7	6.4	7,860	48	E.	SW.	3	1	18	3	6	30	20	10	2	8	9	14	0	13	0	0	0	0	0	M.
8.6	7.4	8.0	8.0	7,285	50	SE.	SW.	1	0	19	16	11	25	11	5	2	2	6	22	0	19	0	0	0	0	0	J.
5.4	.....	3.9	4.6	6,933	44	E.	SW.	1	1	13	6	4	16	11	10	0	13	8	10	1	11	0	0	0	0	0	J.
5.8	.....	5.4	5.6	5,085	32	E.	SW.	0	2	6	2	13	28	6	4	1	7	4	20	1	15	0	0	0	0	0	A.
5.1	.....	4.5	4.8	8,679	60	E.	E.	0	2	20	5	14	12	1	3	3	11	3	16	3	13	0	0	0	1	0	S.
7.4	.....	8.2	7.8	10,323	56	E.	E.†	0	1	17	4	8	17	10	4	1	4	3	24	0	26	0	0	0	0	0	O.
6.8	.....	7.4	7.1	12,393	57	E.	E.	1	0	24	14	8	3	8	2	0	4	4	22	0	24	0	0	0	0	0	N.
7.5	.....	7.8	7.6	15,919	66	E.	E.	0	1	31	13	10	3	1	3	0	7	1	23	0	21	0	0	0	0	0	D.
6.9	.....	6.8	6.9	117,265	.....	..........,	E.	11	18	284	127	102	183	106	71	12	67	72	227	5	223	7	18	0	1	0	Y.

TITUSVILLE, FLA.

[H=12. T=16. h=1.]

Cloudiness (in tenths).				Wind.													Number of days.										
7 a.m.	3 p.m.	10 p.m.	Mean.	Total movement in miles.	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder storms.	Auroras.	Months and year.
4.5	4.8	4.6	4.6	5,257	35	NW.	NW.	14	4	7	11	4	6	6	28	13	12	13	6	0	7	0	0	0	0	0	J.
5.0	6.1	3.5	4.9	5,279	42	NW.	NW.	7	7	4	13	8	16	14	17	1	8	12	9	0	12	0	0	0	10	0	F.
4.3	4.8	2.3	3.8	7,559	30	SE.†	SE.	15	4	5	25	5	14	9	14	2	14	14	3	0	8	0	0	0	0	0	M.
2.4	3.4	2.0	2.6	7,922	37	N.	SE.	5	9	18	20	4	15	11	5	3	16	13	1	0	5	0	0	0	3	0	A.
2.9	4.5	2.9	3.4	8,195	32	E.	SE.	2	6	8	45	6	19	5	2	0	13	16	2	0	8	0	0	0	3	0	M.
2.5	5.1	2.7	3.5	5,992	30	SE.	SE.	0	13	7	26	12	18	8	6	0	14	14	2	0	12	0	0	3	4	0	J.
3.1	.....	4.1	3.6	5,385	24	NE.†	E.	3	6	14	12	5	7	10	5	0	16	10	5	0	14	0	0	6	2	0	J.
2.9	.....	3.3	3.1	6,640	44	E.	SE.	4	5	9	27	4	8	4	1	0	17	9	5	0	12	0	0	3	5	0	A.
5.5	.....	4.9	5.2	7,807	48	SE.†	NE.	9	17	11	12	6	1	0	3	1	6	10	14	0	14	0	0	0	1	0	S.
3.5	.....	3.0	3.2	5,765	28	S.	W.†	3	10	10	11	5	3	11	7	2	18	6	7	0	8	0	0	0	0	0	O.
4.6	.....	5.4	5.0	6,567	37	W.	NW.	3	7	8	7	2	6	6	20	1	11	5	14	0	12	0	0	0	0	0	N.
6.1	.....	5.3	5.7	5,480	29	SE.	W.	8	2	4	6	1	1	18	17	5	12	8	11	0	11	0	0	0	0	0	D.
3.9	.....	3.7	4.0	77,848	.....	....	SE.	73	90	105	215	62	114	102	125	28	157	130	79	0	123	0	0	12	28	0	M.

***Monthly and yearly meteorological summaries*—Continued.**

TOLEDO, OHIO.

[Latitude, 41° 40′ N.; longitude, 83° 34′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
	In.	*In.*	*In.*	°	°	°	°	°	°	°	°	°	°	°	°					*In.*	*In.*
J.....	29.476	30.12	28.76	17.4	21.9	19.1	19.5	46	- 4	27.3	11.4	14	14	15	14	85	72	83	80	2.18	0.86
F ...	29.329	30.09	28.51	22.0	29.9	25.5	25.8	52	- 6	34.7	17.6	18	22	20	20	86	73	79	79	0.75	0.22
M ...	29.380	29.74	28.78	25.1	35.0	30.3	30.1	69	4	39.1	21.5	20	22	23	22	83	62	75	73	3.63	1.15
A ...	29.421	29.81	28.85	40.0	51.9	45.0	45.6	83	26	55.1	36.7	30	31	33	31	68	49	64	60	0.86	0.31
M ...	29.239	29.62	28.86	50.5	60.7	54.1	55.1	81	31	63.9	47.0	43	44	43	43	75	57	68	66	3.26	1.00
J	29.243	29.52	28.97	63.5	75.1	67.8	68.8	95	42	78.7	58.8	56	57	58	57	78	56	72	69	3.69	0.99
J	29.330	29.46	29.10	67.8	....	73.5	70.6	89	49	82.3	62.0	59	.....	62	61	75	.....	69	72	2.92	1.37
A....	29.315	29.59	29.06	65.0	....	72.4	68.7	94	44	80.1	60.3	57	.....	59	58	77	.....	64	70	1.97	0.69
S....	29.354	29.64	28.93	55.0	....	62.2	58.6	86	37	69.8	50.0	47	.....	50	49	76	.....	68	72	0.68	0.37
O ...	29.262	29.64	28.77	43.9	....	48.4	46.2	76	29	55.1	40.1	37	.....	38	38	76	.....	70	73	1.64	0.39
N....	29.412	29.86	28.93	38.6	....	43.8	41.2	74	24	48.9	36.5	31	.....	36	34	76	.....	75	75	3.02	1.58
D....	29.358	29.77	28.83	29.8	....	34.3	32.0	62	13	38.3	26.9	23	.....	26	25	77	.....	75	76	1.26	0.37
Y....	29.343	30.12	28.51	43.2	....	48.0	46.8	95	- 6	56.1	39.1	36	.....	39	38	78	.....	72	72	25.86	....

TOPEKA, KANS.

[Latitude, 39° 3′ N.; longitude, 95° 41′ W.]

J	....	....	....	12.0	25.0	15.4	17.5	58	-20	27.4	6.6	8	14	10	10	83	64	79	75	0.72	0.41
F ...	....	....	....	26.9	40.2	31.6	32.9	65	- 4	44.3	22.7	24	31	28	28	90	70	87	82	1.43	0.75
M ...	....	....	....	30.1	45.8	36.5	37.5	82	8	50.2	24.1	26	31	30	29	86	60	79	75	3.21	1.35
A....	....	....	....	46.5	65.8	54.9	55.7	90	27	70.3	43.1	41	42	43	42	81	48	66	65	1.36	0.66
M ...	....	....	....	51.8	70.7	59.2	60.6	87	30	74.3	45.8	47	49	49	49	86	50	71	69	0.87	0.26
J	....	....	....	64.2	81.3	70.7	72.1	96	36	85.2	58.7	61	65	63	63	89	60	78	76	9.14	3.00
J	....	....	....	72.3	....	81.7	77.0	100	58	91.1	66.9	70	.....	72	70	90	.....	72	81	3.00	1.42
A ...	....	....	....	67.0	....	75.1	71.0	100	50	84.5	62.3	65	.....	67	66	92	.....	77	85	7.23	1.75
S....	....	....	....	56.1	....	66.4	61.2	93	33	80.2	51.5	53	.....	55	54	90	.....	67	79	0.57	0.44
O ...	....	....	....	43.4	....	54.8	49.1	86	25	67.7	40.1	40	.....	41	40	89	.....	61	75	2.39	1.02
N ..	....	....	....	32.2	....	39.0	35.6	81	12	48.6	29.0	30	.....	33	31	92	.....	80	86	2.91	1.72
D....	....	....	....	28.1	....	34.6	31.4	63	- 3	44.9	22.6	25	.....	27	26	89	.....	77	83	1.13	0.55
Y ...	....	....	....	44.2	....	51.7	50.1	100	-20	64.1	39.4	41	.....	43	42	88	.....	74	78	33.96	....

FORT TOTTEN, DAK.

[Latitude, 47° 57′ N.; longitude, 98° 57′ W.]

J.....	28.521	28.89	28.09	-13.3	-6.0	-11.1	-10.1	35	-41	- 2.1	-19.5	-16	- 9	-14	-13	92	86	90	89	0.63	0.35
F ...	28.397	29.10	27.92	- 0.3	6.7	3.1	3.2	38	-42	14.1	- 6.5	- 2	4	1	1	93	87	93	91	0.09	0.04
M ...	28.484	28.99	27.73	2.2	13.7	7.9	7.9	41	-22	18.0	- 2.4	1	10	6	6	93	84	93	90	0.79	0.81
A.....	28.465	29.01	27.84	28.6	42.1	34.6	35.1	74	- 1	45.8	25.5	25	27	28	27	87	58	77	74	0.65	0.15
M....	28.358	28.80	27.81	38.0	54.8	47.3	46.7	76	22	57.7	34.4	30	27	30	29	74	38	55	56	0.60	0.50
J.....	28.183	28.62	27.49	55.6	65.9	62.0	61.2	93	30	70.6	51.3	51	52	54	52	85	64	77	75	7.41	2.64
J.....	28.396	28.68	27.99	61.8	....	70.4	66.1	88	46	78.2	56.5	57	.....	60	58	84	.....	70	77	3.34	1.10
A....	28.406	28.73	28.14	54.9	....	67.6	61.2	94	35	75.0	50.5	50	.....	53	52	85	.....	61	73	0.90	0.49
S....	28.418	28.76	28.03	46.7	....	59.0	52.8	87	29	69.4	43.1	42	.....	42	42	84	.....	56	70	0.47	0.28
O ...	28.324	28.66	27.80	34.0	....	42.8	38.4	78	19	51.1	32.1	30	.....	31	30	88	.....	66	77	0.87	0.43
N....	28.458	28.96	27.98	19.3	....	25.8	22.6	59	- 3	35.1	16.5	16	.....	21	18	88	.....	84	86	0.27	0.20
D....	28.370	28.73	27.92	14.5	....	20.0	17.2	54	- 5	28.1	10.8	11	.....	13	12	87	.....	77	82	0.11	0.04
Y....	28.398	29.10	27.49	28.5	....	35.8	33.5	94	-42	45.1	24.4	25	.....	27	26	87	.....	75	78	16.13	....

VALENTINE, NEBR.

[Latitude, 42° 50′ N.; longitude, 100° 32′ W.]

J	27.365	27.81	26.76	2.2	15.9	8.0	8.7	63	-35	21.9	- 4.6	- 7	5	- 1	- 1	66	64	67	66	0.04	0.02
F....	27.248	27.80	26.90	21.9	34.6	26.5	27.7	62	- 8	41.2	15.3	15	20	19	18	76	61	73	70	0.75	0.29
M ...	27.288	27.69	26.80	16.3	32.6	25.4	24.8	67	-15	37.7	12.9	8	19	17	15	71	63	72	69	1.44	0.63
A....	27.332	27.76	26.70	38.9	60.6	50.5	50.0	88	23	66.0	36.1	30	30	33	31	71	38	56	55	1.05	0.46
M ...	27.202	27.52	26.92	44.5	56.5	51.7	50.9	77	32	61.3	41.6	40	42	43	42	87	62	75	75	9.35	2.54
J	27.127	27.45	26.66	59.1	76.8	67.4	67.8	100	41	80.9	54.9	53	56	56	55	81	50	68	66	2.30	1.18
J	27.316	27.56	26.97	66.2	....	81.0	73.6	103	49	87.9	61.0	60	.....	62	61	80	.....	55	68	4.83	2.34
A....	27.342	27.63	27.09	58.2	....	73.0	65.6	92	41	80.1	55.1	54	.....	57	56	87	.....	60	74	1.77	0.65
S.....	27.373	27.63	27.04	47.9	....	68.6	58.2	99	29	76.6	45.2	42	.....	44	43	78	.....	45	62	0.06	0.04
O....	....	....	....	....	....	....	....	.....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
N....	27.354	27.71	27.02	27.5	....	39.9	33.7	80	9	56.5	24.7	21	.....	27	24	76	.....	63	70	0.19	0.14
D....	27.302	27.77	26.82	22.0	....	33.8	27.9	68	- 2	49.8	18.7	15	.....	21	18	76	.....	63	70	0.26	0.10
Y....	....	....	....	....	....	....	....	.....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....

Monthly and yearly meteorological summaries—Continued.

TOLEDO, OHIO.

[*H*=674. *T*=122. *h*=112.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	10 p.m.	Means.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
7.4	7.1	7.7	7.4	5,259	40	S.W.	W.	6	14	5	3	6	21	23	9	6	2	11	18	0	12	20	30	0	0	0	J.
7.1	6.4	5.2	6.8	5,670	40	S.W.†	S.W.	2	17	7	3	11	21	15	5	6	5	11	13	0	9	10	28	0	0	0	F.
6.4	7.3	5.3	6.3	8,701	40	S.	W.	7	12	10	3	9	8	26	18	0	4	14	13	0	11	8	26	0	0	0	M.
5.0	6.4	3.6	5.0	7,650	38	W.	N.W.	6	12	15	8	6	11	15	17	0	9	11	10	0	9	0	7	0	2	0	A.
6.7	7.6	4.9	6.4	7,546	40	S.†	W.†	2	15	22	9	3	10	22	10	0	2	19	10	0	9	0	1	0	3	0	M.
6.6	6.2	5.1	6.0	6,198	50	W.	S.W.	9	12	12	8	12	19	13	5	0	5	13	12	0	12	0	0	3	4	0	J.
6.2	.....	5.2	5.7	5,570	24	S.W.†	N.E.	5	19	8	5	3	13	4	3	2	7	12	12	0	9	0	0	0	3	0	J.
6.0	.....	4.2	5.1	6,503	30	S.W.	S.W.	7	9	6	2	2	24	7	5	0	11	9	11	0	12	0	0	1	0	0	A.
4.7	.....	3.0	3.8	6,598	32	E.	N.W.†	7	5	9	8	6	6	8	9	2	10	11	9	0	6	0	0	0	1	0	S.
6.8	.....	4.8	5.8	7,688	36	W.	S.W.	7	5	7	6	5	16	9	6	1	8	4	19	0	13	0	3	0	2	0	O.
7.5	.....	7.0	7.2	7,416	36	W.	W.	10	6	4	1	10	10	11	8	0	8	4	18	0	13	0	12	0	1	0	N.
7.4	.....	5.6	6.5	8,425	40	S.W.†	S.	5	2	0	0	19	14	10	12	0	5	7	19	0	13	8	22	0	0	0	D.
6.5	.....	5.1	6.0	83,228	.....	....	S.W.†	73	128	105	56	92	173	163	107	17	76	126	164	0	128	46	129	4	16	0	Y.

TOPEKA, KANS.

[*H*= —. *T*=4. *h*=1.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	10 p.m.	Means.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
4.0	3.8	3.3	3.7	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	14	5	0	4	18	29	0	1	0	J.
4.6	5.4	3.2	4.4	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	12	7	0	10	5	21	0	0	0	F.
5.2	5.4	4.7	5.1	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13	6	12	0	13	5	25	0	2	0	M.
4.4	4.8	2.6	3.9	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	14	4	0	7	0	2	1	1	0	A.
5.5	5.6	4.7	5.3	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	16	8	0	10	0	1	0	8	0	M.
5.0	4.1	3.8	4.3	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	13	5	0	13	0	0	10	7	0	J.
4.2	.....	2.5	3.4	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15	10	6	0	8	0	0	17	4	0	J.
4.5	.....	5.1	4.8	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	14	9	0	12	0	0	5	4	0	A.
3.5	.....	2.1	2.8	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	18	10	2	0	3	0	0	4	0	0	S.
4.5	.....	2.8	3.6	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13	13	5	0	4	0	5	0	3	0	O.
5.7	.....	3.6	4.6	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11	9	10	0	5	2	22	0	0	0	N.
4.8	.....	3.2	4.0	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14	10	7	0	5	7	26	0	0	0	D.
4.7	....	3.5	4.2	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	145	141	80	0	94	37	131	37	30	0	Y.

FORT TOTTEN, DAK.

[*H*=1,487. *T*=15. *h*=4.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	10 p.m.	Means.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
3.7	3.1	3.3	3.4	8,587	52	S.	NW.	13	5	3	7	12	8	8	24	13	14	12	4	0	4	28	31	0	0	1	J.
5.2	4.8	4.6	4.9	9,148	50	S.	NW.	19	6	1	0	10	11	12	22	6	10	11	8	0	5	23	29	0	0	3	F.
5.0	5.2	4.3	4.8	11,177	58	N.	N.	21	9	9	11	16	0	8	12	7	12	10	9	0	8	28	31	0	0	1	M.
5.4	4.3	3.8	4.6	12,925	54	W.†	SE.	13	12	6	19	9	9	5	17	0	8	17	5	0	6	3	22	0	0	2	A.
3.9	5.3	3.8	4.3	8,880	40	S.	N.	30	18	12	6	9	2	5	10	1	10	16	5	0	4	0	11	0	0	0	M.
5.5	6.6	5.7	6.0	11,462	60	SE.†	SE.	13	11	12	19	16	9	6	4	0	6	13	11	0	15	0	1	2	7	0	J.
3.8	.....	3.2	3.5	8,172	48	SE.	N.	13	7	5	10	6	7	5	9	0	17	6	8	0	9	0	0	0	2	0	J.
3.2	.....	3.4	3.3	7,125	36	SE.	SW.	11	7	5	4	0	15	9	8	3	19	5	7	0	7	0	0	5	2	0	A.
3.0	.....	2.7	2.8	10,359	46	NW.	NW.	6	4	3	10	7	3	7	19	1	17	8	5	0	4	0	3	0	1	0	S.
5.3	.....	5.1	5.2	10,088	48	NW.	NW.	5	5	1	9	7	7	4	24	0	10	8	13	0	7	1	14	0	0	0	O.
3.0	.....	3.3	3.2	7,882	46	NW.	NW.	6	1	4	8	13	6	3	16	3	18	3	9	0	3	14	30	0	0	0	N.
4.7	.....	3.6	4.2	9,853	38	NW.	NW.	15	1	0	8	7	7	6	18	0	14	11	6	0	5	18	31	0	0	2	D.
4.3	.....	3.9	4.2	115,658	.....	....	NW.	165	86	61	111	112	84	78	183	34	155	120	90	0	77	*	203	7	12	9	Y.

VALENTINE, NEBR.

[*H*=2,613. *T*=23. *h*=31.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a.m.	3 p.m.	10 p.m.	Means.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
2.4	4.0	2.2	2.9	7,898	56	N.	NW.	5	3	3	2	6	11	24	29	10	17	11	3	0	3	21	31	0	0	0	J.
4.9	5.7	3.8	4.8	7,173	48	NW.	N.	18	8	4	2	8	8	14	16	9	9	12	8	0	7	7	29	0	0	0	F.
4.9	5.5	3.3	4.6	8,848	38	NW.	N.	24	2	12	10	10	7	8	16	4	12	13	6	0	10	12	29	0	0	0	M.
3.5	3.8	3.3	3.6	9,692	56	S.†	N.	22	6	9	5	15	6	11	9	7	14	12	4	0	6	0	10	0	0	0	A.
5.9	6.7	6.1	6.2	9,308	42	N.	N.	25	18	12	10	6	5	3	13	1	5	13	13	0	20	0	0	0	7	0	M.
5.4	4.6	3.4	4.5	11,402	60	S.	S.	5	5	7	13	25	4	8	19	4	10	17	3	0	6	0	0	8	2	0	J.
4.5	.....	3.3	3.9	7,355	54	NW.	N.	13	6	4	11	9	8	4	3	4	11	14	6	0	10	0	0	11	6	0	J.
3.6	.....	4.2	3.9	6,306	54	S.	N.	15	8	3	7	7	4	12	5	1	11	12	8	0	10	0	0	3	3	0	A.
1.5	.....	2.0	1.8	7,531	48	N.†	N.	12	4	6	5	8	4	11	10	0	20	7	3	0	2	0	1	1	0	0	S.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	O.
2.9	.....	1.9	2.4	6,333	36	N.†	SW.	9	2	2	2	8	17	7	8	5	19	5	6	0	2	1	26	0	0	0	N.
2.1	.....	1.8	2.0	6,367	36	NW.	W.	8	1	4	0	7	7	23	10	2	22	3	6	0	3	4	30	0	0	0	D.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	Y.

* 115.

Monthly and yearly meteorological summaries—**Continued.**

VICKSBURG, MISS.

[Latitude, 32° 22′ N.; longitude, 90° 53′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a.m.	3 p.m.	10 p.m.	Mean.	7 a.m.	3 p.m.	10 p.m.	Mean.	Total.	Max. 24 hours.
	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°					In.	In.
J....	30.039	30.39	29.71	40.0	50.6	47.0	45.9	78	18	55.3	38.1	37	40	41	39	91	71	80	81	3.26	0.84
F....	29.839	30.31	29.44	47.4	58.1	52.6	52.7	74	28	61.5	45.3	45	46	45	45	91	66	78	78	4.96	1.42
M....	29.879	30.32	29.43	48.5	62.4	56.2	55.7	84	31	65.9	46.1	43	46	47	46	82	59	73	72	7.92	2.82
A....	29.890	30.07	29.61	61.1	76.0	69.0	68.7	85	46	79.2	58.7	55	55	57	56	82	51	66	66	2.44	1.27
M...	29.695	29.90	29.47	65.1	78.6	71.3	71.7	89	50	82.0	62.6	61	60	61	61	88	54	71	71	3.55	1.41
J....	29.732	29.97	29.54	71.9	83.0	76.0	77.0	93	60	87.0	69.1	68	67	68	68	88	61	78	75	2.18	0.56
J....	29.790	29.91	29.61	77.8	....	83.8	80.8	97	65	92.3	73.2	74	.....	73	73	87	.....	70	79	3.04	1.38
A....	29.738	29.92	29.14	76.2	....	80.1	78.2	97	68	89.9	72.8	73	......	73	73	89	.....	79	84	11.10	2.75
S	29.792	30.13	29.66	67.7	....	74.3	71.0	90	50	83.3	64.8	64	.....	65	65	89	.....	76	83	1.32	0.77
O....	29.808	30.09	29.58	58.3	... ...	65.7	62.0	85	44	73.9	55.4	53	.....	56	54	85	.....	71	78	2.97	1.72
N....	29.878	30.16	29.38	50.2	....	57.6	53.9	81	35	64.9	48.1	47	.....	48	47	88	.. ..	71	80	2.19	0.96
D....	29.929	30.28	29.52	43.2	....	52.1	47.6	70	24	59.1	40.5	38	.....	40	39	81	.....	66	73	3.54	1.26
Y....	29.834	30.39	29.14	59.0	....	65.5	63.8	97	18	74.5	56.2	55	.....	56	55	87	.....	73	77	48.47	....

WALLA WALLA, WASH.

[Latitude 46° 2′ N.; longitude 118° 20′ W.]

J.....	29.051	29.72	28.44	20.5	23.8	22.1	22.1	65	-17	29.6	15.0	13	15	15	14	76	73	76	75	2.21	0.58
F ...	29.019	29.39	28.47	41.2	49.1	45.9	45.4	65	31	53.5	38.0	33	34	34	34	75	58	66	66	0.80	0.36
M ...	28.911	29.25	28.55	38.8	48.7	46.6	44.7	71	12	54.2	34.9	28	29	30	29	67	50	55	57	1.44	0.51
A....	28.984	29.30	28.59	49.2	63.6	61.6	58.1	85	36	69.3	46.4	34	31	33	33	59	31	35	42	0.69	0.39
M ...	28.823	29.12	28.53	53.6	70.6	70.3	64.8	95	41	77.2	50.8	36	36	36	36	54	29	31	38	0.21	0.12
J.....	28.790	29.12	28.54	57.5	68.2	69.5	65.1	89	47	75.8	54.9	48	47	47	47	71	49	47	56	2.37	1.08
J.....	28.906	29.23	28.66	61.5	....	84.1	72.8	102	48	87.7	59.2	42	.....	36	39	52	.....	20	36	0.46	0.43
A....	28.866	29.10	28.60	64.9	....	89.0	77.0	102	53	90.8	62.4	42	.....	38	40	45	.....	18	32	0	0
S.....	28.922	29.34	28.58	59.7	....	80.1	69.9	100	44	82.6	55.9	41	.....	42	41	52	.....	27	39	0.02	0.02
O....	28.928	29.28	28.56	50.5	....	61.9	56.2	81	33	65.6	48.0	41	.....	41	41	71	.....	49	60	2.33	1.13
N ...	29.046	29.34	28.60	35.7	....	41.1	38.4	63	18	45.0	33.4	31	.....	34	33	85	.....	77	81	0.87	0.38
D ...	29.004	29.59	28.46	33.4	....	37.8	35.6	64	18	41.1	30.3	31	.....	33	32	91	.....	86	88	2.19	0.78
Y ...	28.938	29.72	28.44	47.2	....	59.2	54.2	102	-17	64.4	44.1	35	.....	35	35	66	.....	49	56	13.59	....

WASHAKIE, FORT, WYO.

[Latitude, 43° 1′ N.; longitude, 108° 54′ W.]

J.....	24.467	24.79	24.02	0.3	15.1	4.7	6.7	49	-42	19.2	-6.0	-7	4	-2	-2	77	64	77	73	1.02	0.84
F....	24.395	24.75	24.06	23.3	39.3	31.4	31.3	55	2	42.2	20.1	19	21	24	21	83	51	74	69	0.94	0.66
M ...	24.354	24.78	23.98	19.6	33.8	28.2	27.2	62	-8	37.7	15.0	14	18	19	17	79	58	72	70	1.92	0.78
A....	24.468	24.81	24.02	37.1	59.1	50.2	48.8	76	26	63.1	34.6	26	32	33	30	66	38	54	53	0.64	0.54
M ...	24.380	24.74	24.06	39.1	56.3	50.1	48.5	80	25	60.4	36.6	34	39	38	37	82	55	69	68	4.57	1.25
J.....	24.336	24.59	24.08	48.2	70.4	61.7	60.1	91	36	75.3	44.9	40	43	42	42	74	40	52	56	0.34	0.21
J.....	24.542	24.73	24.36	57.6	... .	78.2	67.9	99	43	85.0	53.4	44	.....	41	42	63	.....	32	47	0.87	0.55
A....	24.562	24.76	24.37	51.6	....	71.5	61.6	88	40	79.1	48.9	43	....	43	43	73	.....	39	56	1.94	1.42
S.....	24.578	24.83	24.34	45.7	....	70.5	58.1	85	34	76.6	42.6	36	.....	39	38	69	.....	33	51	0.32	0.28
O.....	24.438	24.65	24.06	35.5	....	50.8	43.2	69	17	59.4	32.0	27	.....	29	28	72	.....	46	59	0.38	0.38
N....	24.482	24.72	24.24	17.2	....	26.7	22.0	60	-3	38.2	15.2	12	.....	18	15	80	.....	70	75	0.26	0.15
D....	24.476	24.87	24.08	10.9	....	19.9	15.4	52	-16	34.4	7.8	6	.....	9	8	79	.....	63	71	0.11	0.10
Y....	24.457	24.87	23.98	32.2	....	45.3	40.9	99	-42	55.9	28.8	24	.....	28	27	75	.....	57	62	13.31	....

WASHINGTON CITY.

[Latitude, 38° 54′ N.; longitude, 77° 3′ W.]

J.....	30.109	30.72	29.63	25.9	33.0	28.8	29.2	54	9	37.5	22.7	20	22	22	21	79	65	77	74	2.99	0.85
F.....	29.994	30.57	29.43	31.2	41.0	35.0	35.7	61	13	44.6	27.8	27	28	28	28	84	64	78	76	3.19	1.13
M....	29.986	30.39	29.30	32.3	43.0	37.0	37.4	76	10	47.1	29.0	26	28	27	27	79	59	70	69	4.53	1.65
A ...	30.027	30.50	29.46	45.7	61.3	51.7	52.9	89	32	64.4	42.4	37	36	39	37	72	42	63	59	1.89	0.80
M....	29.880	30.17	29.57	58.0	69.1	60.9	62.7	89	39	71.4	54.5	53	54	54	54	84	61	79	74	4.77	0.74
J.....	29.846	30.16	29.63	68.0	80.9	70.0	73.0	94	52	82.6	63.1	61	63	62	62	78	56	76	70	3.53	1.41
J.....	29.930	30.15	29.52	70.9	....	74.9	72.9	94	56	82.5	64.6	65	.....	65	65	82	.....	72	77	4.47	2.98
A ...	29.914	30.17	29.34	72.2	....	75.6	73.9	97	52	85.5	66.2	67	.....	67	67	84	.....	75	80	3.35	0.91
S.....	29.968	30.39	29.61	62.1	....	64.2	63.2	84	39	72.1	57.4	58	.....	58	58	86	.....	82	84	6.82	1.63
O....	29.908	30.30	29.43	48.8	....	52.2	50.5	75	35	60.9	44.3	43	.....	44	43	80	.....	73	77	3.27	1.02
N ...	30.050	30.61	29.41	43.8	....	47.7	45.8	75	24	54.9	39.9	37	.....	39	38	78	.....	72	75	2.97	1.08
D ...	30.004	30.51	28.85	32.9	....	37.5	35.2	61	16	45.1	29.9	25	.....	26	25	74	.....	63	68	3.27	2.70
Y ...	29.968	30.72	28.85	49.3	....	53.0	52.7	97	9	62.4	45.2	43	.....	44	44	80	.....	73	74	45.05	....

Monthly and yearly meteorological summaries—Continued.

VICKSBURG, MISS.

[*H*=222. *T*=60. *h*=54.]

Cloudiness (in tenths).				Wind.														Number of days—										
7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.9	7.0	5.7	6.5	4,677	25	SE.	N.	22	12	5	7	18	12	0	7	10	7	8	16	0	15	1	9	0	0	0	J.
7.3	6.1	5.8	6.4	4,356	36	W.†	S.	8	15	10	6	17	2	11	9	9	6	7	16	0	13	0	1	0	1	0	F.
5.3	5.2	4.5	5.0	6,172	36	NW.†	N.	24	4	6	14	17	9	10	9	0	13	7	11	0	12	0	1	0	2	0	M.
4.1	4.8	2.5	3.8	4,922	30	N.	S.	7	10	8	10	20	19	10	5	1	10	18	2	0	5	0	0	0	1	0	A.
5.2	5.8	4.1	5.1	4,734	39	NW.	S.	16	6	3	12	17	15	9	9	6	8	17	6	0	11	0	0	0	5	0	M.
5.8	7.0	4.0	5.6	3,901	33	W.	S.	11	6	8	20	22	11	7	2	3	7	13	10	0	11	0	0	4	6	0	J.
3.0	.....	5.5	4.2	3,113	25	S.	E.	11	11	12	6	6	6	2	1	7	8	17	6	0	8	0	0	23	4	0	J.
6.1	.....	7.6	6.8	4,017	40	W.	E.	4	8	15	12	9	6	0	0	8	2	12	17	0	16	0	0	15	4	0	A.
5.8	.....	4.5	4.9	2,598	24	SE.	NE.	6	26	9	2	1	0	0	0	16	12	6	12	0	7	0	0	1	0	0	S.
4.7	.....	3.6	4.2	3,655	15	NE.†	SE.	10	11	7	13	8	2	0	4	7	6	12	13	0	8	0	0	0	0	0	O.
6.7	.....	5.3	6.0	4,094	27	W.	SE.	11	12	9	13	7	2	2	2	2	6	8	16	0	11	0	0	0	0	0	N.
5.6	.....	3.6	4.6	4,497	36	SE.	SE.	11	9	11	15	4	0	2	4	6	12	7	12	0	6	0	2	0	0	0	D.
5.5	.....	4.7	5.3	50,736	....	....	S.	141	130	103	130	146	84	53	52	75	97	132	137	0	123	1	13	43	23	0	Y.

WALLA WALLA, WASH.

[*H*=1,018. *T*=66. *h*=56.]

7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.8	6.9	6.1	6.3	4,610	35	SW.	SW.	6	2	0	9	23	41	8	1	3	9	7	15	0	13	17	24	0	0	0	J.
5.4	5.4	4.6	5.1	4,213	35	SW.	SW.	3	0	0	8	14	45	9	7	1	8	12	9	0	7	0	4	0	0	0	F.
5.5	6.6	6.5	6.2	5,154	38	SW.	SW.	10	1	5	9	12	39	11	5	1	6	13	12	0	11	1	9	0	0	0	M.
5.2	4.0	5.6	4.9	5,165	45	SW.	SW.	1	1	1	5	11	45	16	6	1	4	22	4	0	5	0	0	0	0	0	A.
2.9	2.8	3.2	3.0	5,041	30	SW.	SW.	8	19	8	6	3	33	11	3	2	19	7	5	0	3	0	0	2	0	0	M.
6.5	6.5	4.2	5.7	4,766	65	SW.	SW.	6	5	3	8	13	39	12	2	2	4	18	8	0	13	0	0	0	2	0	J.
2.2	.....	1.9	2.0	5,040	26	SW.	SW.	4	3	2	5	10	21	10	5	2	24	3	4	0	3	0	0	13	0	0	J.
1.7	.....	0.7	1.2	4,404	20	SW.	SW.	8	3	1	4	15	20	7	3	1	27	4	0	0	0	0	0	17	0	0	A.
2.2	.....	2.8	2.5	3,641	25	SW.	SW.	9	5	0	3	13	19	9	2	0	19	7	4	0	1	0	0	3	1	0	S.
6.3	.....	6.0	6.2	4,539	40	SW.	SW.	2	2	0	1	14	32	9	0	2	8	7	16	0	10	0	0	0	0	0	O.
6.1	.....	6.2	6.2	3,166	28	W.	SW.	3	4	2	5	10	26	5	2	3	7	8	15	1	6	4	12	0	0	0	N.
5.4	.....	6.9	6.2	2,487	30	SW.	SW.	7	3	1	6	6	27	4	3	5	2	7	22	3	14	7	18	0	0	0	D.
4.6	.....	4.6	4.6	52,217	.....	....	SW.	67	51	23	69	144	387	111	39	23	137	115	114	4	86	29	67	35	3	0	Y.

WASHAKIE, FORT, WYO.

[*H*=5.580. *T*=23. *h*=16.]

7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
2.7	5.1	3.4	3.8	1,565	28	S.†	SW.	2	6	8	7	6	22	13	0	29	15	12	4	0	2	21	31	0	0	0	J.
3.9	5.1	4.2	4.4	4,775	48	S.	SW.	7	5	6	12	4	24	20	6	3	9	15	5	0	4	2	27	0	0	0	F.
5.1	5.9	5.6	5.5	3,660	36	SW.	SW.	2	9	2	21	11	26	16	3	3	4	17	10	0	8	12	29	0	0	0	M.
3.4	3.0	2.9	3.1	4,674	42	SW.	SW.	5	7	3	12	2	27	26	6	2	17	10	3	0	3	0	12	0	0	0	A.
5.8	6.9	7.4	6.7	4,932	36	W.†	SW.	8	6	5	8	9	23	22	11	1	4	13	14	0	14	0	3	0	1	0	M.
4.0	5.2	4.4	4.5	5,507	54	NW.	SW.	5	8	4	4	8	28	26	7	0	10	16	4	0	4	0	0	1	2	0	J.
2.8	.....	4.3	3.6	4,398	30	SW.†	SW.	4	4	3	1	3	29	10	5	3	12	13	6	0	6	0	0	7	3	0	J.
2.3	.....	5.3	3.8	4,039	35	NW.†	SW.	3	9	3	2	1	23	14	7	0	9	17	5	0	6	0	0	0	5	0	A.
1.0	.....	2.7	1.8	3,700	41	W.	SW.	4	10	1	3	3	28	8	3	0	21	8	1	0	3	0	0	0	1	0	S.
3.0	.....	4.1	3.6	4,360	37	NW.	SW.	0	5	2	0	5	24	18	8	0	10	19	2	0	2	0	15	0	0	0	O.
3.8	.....	2.8	3.3	2,933	34	SW.	SW.	0	11	3	5	2	24	11	3	1	15	8	7	0	3	6	28	0	0	0	N.
.8	.....	1.7	1.2	2,839	36	W.	SW.	1	2	2	0	3	39	13	0	2	24	5	2	0	2	7	31	0	0	0	D.
3.2	.....	4.1	3.8	47,382	.....	....	SW.	41	82	42	75	57	317	197	59	44	150	153	63	0	57	48	176	8	12	0	

WASHINGTON CITY.

[*H*=103. *T*=58. *h*=51.]

7 a.m.	3 p.m.	10 p.m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
6.2	5.6	5.3	5.7	4,321	30	NW.	NW.	6	10	4	8	5	6	2	40	12	5	18	8	0	10	9	27	0	0	0	J.
6.1	5.5	5.1	5.6	3,539	24	NW.	NW.	14	11	6	3	10	8	3	25	7	9	9	11	0	13	2	19	0	0	0	F.
5.2	5.4	4.0	4.9	6,152	42	NW.	NW.	13	11	7	4	9	2	6	39	2	11	11	9	0	12	3	19	0	1	0	M.
4.2	4.3	2.2	3.6	5,147	33	NW.	NW.	7	4	4	14	17	3	5	29	7	13	15	2	0	9	0	1	0	1	0	A.
7.8	6.4	6.9	7.0	4,040	27	SW.	NW.	6	14	11	11	14	7	3	15	12	4	10	17	0	17	0	0	0	5	0	M.
3.7	4.0	3.6	3.8	3,478	36	NW.	N.	15	12	1	5	14	8	8	12	15	13	13	4	0	9	0	0	8	5	0	J.
3.2	.....	4.6	3.9	8,366	18	NW.†	S.	3	5	7	10	11	6	8	6	6	17	4	10	0	10	0	0	1	4	0	J.
4.3	.....	3.7	4.0	2,896	36	W.	S.	4	1	6	8	13	12	7	7	4	18	4	9	0	13	0	0	7	5	0	A.
5.4	....	5.2	5.3	3,166	24	NW.	NW.	11	12	4	2	5	2	3	19	2	10	5	15	0	14	0	0	0	1	0	S.
5.2	.....	5.1	5.2	3,823	24	NW.	NW.	3	2	2	4	11	7	6	20	7	11	7	13	0	16	0	0	0	0	0	O.
5.8	.....	5.8	5.8	3,840	25	NW.	NW.	13	5	4	2	11	0	2	15	8	9	6	15	0	10	0	6	0	0	0	N.
5.3	.....	2.2	3.8	4,106	34	NW.	NW.	8	3	1	5	6	1	1	22	15	16	8	7	0	6	0	16	0	0	0	D.
5.2	.....	4.5	4.9	47,874	.....	....	NW.	103	90	57	76	126	62	54	249	97	136	110	120	0	139	14	88	16	22	0	Y.

Monthly and yearly meteorological summaries—Continued.

WHIPPLE BARRACKS, PRESCOTT, ARIZ.

[Latitude, 34° 33′ N.; longitude, 112° 28′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
	In.	*In.*	*In.*	°	°	°	°	°	°	°	°	°	°	°	°					*In.*	*In.*
J	24.740	25.14	24.32	18.6	36.0	27.9	27.5	56	-12	40.5	15.6	14	26	23	21	81	67	82	77	1.30	0.58
F ...	24.635	24.87	24.35	31.2	49.3	40.9	40.5	63	22	53.4	28.9	26	33	31	30	81	56	69	69	1.68	0.95
M ...	24.635	25.01	24.34	30.5	50.5	42.0	41.0	69	5	53.6	27.7	25	30	30	28	82	49	66	66	1.66	0.73
A....	24.746	24.93	24.50	42.1	66.7	57.0	55.3	78	31	70.1	39.6	35	37	43	38	78	35	60	57	0.52	0,32
M ...	24.650	24.81	24.50	44.4	69.8	61.5	58.6	85	34	73.1	43.2	37	41	44	41	77	37	53	56	0.96	0.84
J	24.679	24.82	24.46	50.8	81.3	73.2	68.4	89	37	84.3	49.8	41	47	49	46	70	31	44	48	0.00	0.00
J	24.806	24.95	24.70	60.3	....	84.6	72.4	96	47	89.3	59.1	52	.....	55	54	75	.....	40	58	2.49	1.42
A....	24.792	24.94	24.68	57.6	....	80.3	69.0	94	48	85.2	55.0	43	.....	39	41	60	.....	27	44	1.42	0.60
S	24.790	24.91	24.66	54.6	....	76.5	65.6	90	46	83.1	52.2	39	.....	39	39	59	.....	30	44	0.62	0.27
O ...	24.726	24.90	24.57	43.0	....	62.9	53.0	84	29	70.8	41.0	30	.....	32	31	63	.....	37	50	1.75	1.11
N ...	24.710	24.91	24.51	37.4	....	46.0	41.7	64	24	53.4	34.3	32	.....	34	33	84	.....	66	75	3.18	1.19
D ...	24.764	25.03	24.45	28.9	....	39.9	34.4	58	18	49.2	26.6	25	.....	29	27	88	.....	68	78	2.94	1.04
Y ...	24.727	25.14	24.32	41.6	....	57.7	52.3	96	-12	67.2	39.4	33	.....	37	36	75	.....	54	60	18.52	....

WICHITA, KANS.

[Latitude, 37° 41′ N.; longitude, 97° 20′ W.]

J.....	....	....	....	....	....	....	....	......	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
F.....	....	....	....	....	....	....	....	......	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
M ...	....	....	....	....	....	....	....	......	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
A.....	....	....	....	....	....	....	....	......	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
M ...	....	....	....	....	....	....	....	......	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
J.....	....	....	....	....	....	....	....	......	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....
J.....	28.577	28.79	28.40	73.1	....	86.8	80.0	100	65	92.7	70.3	67	.....	64	66	81	.....	49	65	1.04	0.35
A.....	28.560	28.79	28.18	69.3	....	79.6	74.4	102	58	86.8	66.0	64	.....	65	65	85	.....	64	74	7.77	2.62
S	28.614	28.91	28.46	59.0	....	73.3	66.2	92	41	81.0	56.9	52	.....	52	52	78	.....	50	64	1.89	0.95
O.....	28.565	28.82	28.20	46.6	....	60.2	53.4	86	32	68.8	44.3	39	.....	42	40	78	.....	52	65	1.36	0.88
N....	28.682	29.06	28.25	36.7	....	42.7	39.7	78	23	49.6	33.5	32	.....	33	32	85	.....	70	77	1.29	1.08
D....	28.652	29.06	28.11	31.4	....	40.3	35.8	67	16	49.0	28.3	26	.....	29	28	82	.....	67	75	0.71	0.30
Y ...	....	....	....	....	....	....	....	......	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	....	....

WILMINGTON, N. C.

[Latitude, 34° 14′ N.; longitude, 77° 57′ W.]

J	30.172	30.64	29.83	41.7	52.5	45.3	46.5	75	20	56.3	37.1	37	42	40	40	85	69	81	78	2.21	0.60
F.....	30.041	30.57	29.59	43.5	57.1	48.1	49.6	72	25	60.1	41.1	40	46	43	43	87	69	84	80	6.22	3.23
M ...	30.062	30.44	29.50	46.1	58.3	49.9	51.4	76	24	60.8	41.1	41	47	44	44	84	68	80	77	4.74	1.45
A....	30.107	30.56	29.70	56.9	69.0	59.1	61.7	88	37	72.0	51.2	51	56	53	53	80	65	80	75	1.10	0.99
M ...	29.938	30.22	29.72	67.5	74.5	67.8	69.9	86	51	77.2	63.0	63	66	64	64	86	76	87	83	4.41	2.24
J	29.935	30.28	29.66	72.7	81.5	73.2	75.8	94	53	85.3	68.4	68	69	69	69	85	68	87	80	3.56	1.01
J	29.994	30.20	29.76	75.2	....	76.5	75.8	96	60	86.0	68.9	69	.....	70	70	82	.....	81	82	5.87	1.93
A ...	30.020	30.18	29.80	76.6	....	77.1	76.9	95	59	86.4	70.0	72	.....	71	72	85	.....	83	84	4.61	1.56
S.....	29.990	30.19	29.73	70.6	....	71.6	71.1	88	44	80.3	65.4	67	.....	67	67	88	.....	85	86	8.28	1.73
O ...	29.992	30.32	29.39	58.0	....	61.4	59.7	79	45	70.8	54.3	53	.....	54	54	85	.....	78	82	5.65	2.84
N ...	30.056	30.43	29.64	52.5	....	55.9	54.2	79	36	63.9	50.0	48	.....	49	48	85	.....	79	82	5.50	2.78
D ...	30.098	30.54	29.40	40.6	... .	46.6	43.6	68	26	55.0	38.6	34	.....	37	36	79	.....	71	75	2.92	1.53
Y ...	30.034	30.64	29.39	58.5	....	61.0	61.4	96	20	71.2	54.1	54	.....	55	55	84	.....	81	80	55.07	....

WINNEMUCCA, NEV.

[Latitude, 40° 58′ N.; longitude, 117° 43′ W.]

J.....	25.677	26.19	25.03	13.2	24.5	18.4	18.7	50	-28	29.4	7.8	10	18	14	14	88	79	88	83	1.40	0.71
F....	25.705	25.98	25.28	31.7	45.8	39.1	38.9	63	17	49.9	28.2	28	27	29	28	88	50	69	69	0.63	0.36
M....	25.598	26.01	25.22	29.7	47.1	40.6	39.1	71	10	53.2	26.1	.....	.....	.....	.....	.....	.....	.....	.....	0.21	0.10
A	25.683	25.95	25.35	40.8	63.1	59.9	54.6	83	21	68.1	35.2	17	13	10	14	41	18	19	26	0.20	0.18
M....	25.565	25.75	25.37	44.9	64.2	61.4	56.8	90	23	69.3	40.1	25	20	21	22	52	23	29	34	0 52	0.13
J.....	25.556	25.78	25.32	52.4	69.0	67.0	62.8	88	39	74.6	48.5	31	24	25	27	47	21	25	31	0.21	0.17
J.....	25.658	25.89	25.40	58.7	......	85.8	72.2	96	40	88.7	54.4	26	...	19	22	32	...	10	21	0.01	0.01
A ...	25.655	25.81	25.49	56.9	......	85.6	71.2	96	45	88.1	51.2	21	...	18	20	28	.....	9	18	T.	T.
S.....	25.620	25.88	25.48	54.8	......	80.9	67.8	94	40	84.2	48.9	29	...	26	28	41	.....	17	29	0.24	0.12
O....	25.670	25.91	25.45	40.5	......	61.9	51.2	80	21	66.3	34.9	21	...	20	20	49	.....	24	36	0.08	0.07
N ...	25.684	25.94	25.44	31.4	......	45.7	38.6	64	4	51.6	26.8	23	...	22	23	72	.....	42	57	0.52	0.28
D....	25.694	26.02	25.28	29.7	......	40.5	35.1	58	11	45.5	24.7	22	...	24	23	75	.....	55	65	0.87	0.32
Y ...	25.652	26.19	25.03	40.4	......	57.2	50.6	96	-28	64.1	35.6	...	...	...	...	...	.....	...	...	4.89	....

Monthly and yearly meteorological summaries—**Continued.**

WHIPPLE BARRACKS, PRESCOTT, ARIZ.

[*H*=5,389. *T*=11. *h*=3.]

Cloudiness (in tenths).				Wind.													Number of days—										
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
2.5	3.9	3.0	3.1	3,708	45	SW.	SW.	8	24	4	1	4	26	1	4	21	19	6	6	0	6	7	29	0	0	0	J.
2.8	5.0	3.3	3.7	3,848	40	SW.	SW.	5	6	4	6	11	27	6	8	14	13	13	3	0	8	0	25	0	2	0	F.
3.0	5.1	2.9	3.7	5,730	36	SW.†	SW.	6	7	1	7	14	28	10	5	15	15	10	6	0	7	0	22	0	0	0	M.
2.1	4.9	3.6	3.6	5,033	40	SW.	SW.	4	5	16	4	11	17	12	8	13	10	18	2	0	6	0	1	0	4	0	A.
1.6	2.8	3.9	2.8	5,968	36	SW.†	SW.	7	1	3	5	19	33	14	2	9	19	9	3	0	3	0	0	0	4	0	M.
1.2	1.4	1.3	1.3	8,842	47	S.	SW.	0	1	2	11	17	45	6	1	7	24	6	0	0	0	0	0	0	0	0	J.
3.1	.....	3.6	3.4	6,180	36	SW.†	W.	1	0	3	3	8	10	17	4	16	15	7	9	0	9	0	0	18	14	0	J.
2.0	.....	3.6	2.8	6,391	54	E.	W.	2	2	5	1	2	18	21	8	3	18	8	5	0	10	0	0	4	17	0	A.
2.4	.....	4.5	3.4	4,630	40	W.	SE.	4	5	4	18	4	12	8	4	1	14	9	7	0	8	0	0	1	12	0	S.
2.1	.....	3.3	2.7	5,588	39	S.	SW.	1	2	1	8	1	25	14	7	3	17	6	8	0	5	0	2	0	8	0	O.
5.7	.....	5.1	5.4	5,535	52	SW.	SW.	8	2	6	7	4	15	14	3	1	8	9	13	0	13	0	12	0	0	0	N.
3.6	.....	4.3	4.0	4,611	48	SW.	E.	5	4	12	9	10	5	8	9	0	12	6	13	0	10	0	25	0	1	0	D.
2.7	.....	3.5	3.3	66,064	.....	....	SW.	51	59	61	80	105	261	131	63	103	184	107	75	0	85	7	116	23	62	0	Y.

WICHITA, KANS.

[*H*=1,354. *T*=78. *h*=71.]

.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	J.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	F.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	M.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	A.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	M.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	J.
4.0	.....	3.1	3.6	5,405	23	S.	S.	3	6	2	13	33	1	2	2	0	17	9	5	0	8	0	0	21	11	0	J.
6.2	.....	5.3	5.8	5,973	44	NW.	S.	9	12	6	10	20	1	0	3	1	8	14	9	0	13	0	0	11	16	0	A.
2.6	.....	2.0	2.3	4,824	30	NW.	SE.	8	8	5	18	14	2	1	4	0	21	8	1	0	4	0	0	5	6	0	S.
4.0	.....	3.3	3.6	6,766	36	S.	S.	13	6	2	3	20	8	4	5	1	14	13	4	0	7	0	0	0	4	0	O.
6.0	.....	4.8	5.4	6,238	44	N.	N.	18	5	4	8	15	1	1	7	1	7	11	12	0	5	0	17	0	1	0	N.
4.6	.....	3.4	4.0	7,341	32	S.	N.	21	2	2	10	19	2	3	3	0	16	6	9	0	8	1	23	0	0	0	D.
.....	.....	.....	.....	....	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	...	.....	...	...	...	Y.

WILMINGTON, N. C.

[*H*=52. *T*=60. *h*=52.]

4.4	5.4	3.4	4.4	5,403	27	SW.	NW.	10	18	6	1	1	20	14	21	2	13	9	9	0	17	0	10	0	0	0	J.
5.3	5.2	3.6	4.7	4,846	26	NW.	NE.	9	21	6	7	3	18	11	11	1	10	13	6	0	12	0	5	0	0	0	F.
4.9	4.7	4.1	4.6	6,587	35	SW.	SW.	7	7	9	5	11	25	7	21	1	13	10	8	0	11	0	6	0	0	0	M.
4.0	3.2	3.1	3.4	6,085	28	SW.	SW.	6	13	14	8	9	26	4	9	1	15	9	6	0	6	0	0	0	3	0	A.
6.6	6.0	3.8	5.4	5,852	24	E.	SW.	5	7	6	9	18	40	2	5	1	6	16	9	0	9	0	0	0	3	0	M.
5.1	6.1	3.0	4.7	4,481	34	SW.	SW.	0	14	7	13	5	38	6	7	0	10	13	7	0	10	0	0	3	3	0	J.
4.7	.....	4.9	4.8	4,448	30	NW.	E.	6	9	18	5	5	9	6	8	1	11	11	9	0	11	0	0	6	6	0	J.
4.3	.....	4.2	4.2	4,135	28	SW.	SW.	5	10	5	5	4	27	1	3	2	11	11	9	0	13	0	0	8	6	0	A.
5.9	.....	5.5	5.7	4,849	36	SW.	NE.	7	20	3	2	8	12	2	4	2	6	8	16	0	16	0	0	0	5	0	S.
4.2	.....	3.7	4.0	4,747	60	NE.	NE.	6	11	10	0	6	10	8	4	7	13	7	11	0	13	0	0	0	1	0	O.
4.6	.....	4.3	4.4	4,864	34	SE.	NE.	10	16	7	3	3	4	4	1	12	11	5	14	0	14	0	0	0	1	0	N.
3.7	.....	3.3	3.5	4,046	28	SW.	N.	10	9	8	0	6	4	9	8	8	16	8	7	0	11	0	6	0	0	0	D.
4.8	.....	3.9	4.5	60,343	.....	....	SW.	81	155	94	58	79	233	74	102	38	135	120	111	0	143	0	27	17	28	0	Y.

WINNEMUCCA, NEV.

[*H*=4,340. *T*=62. *h*=54.]

5.0	6.2	4.0	5.1	5,805	45	SW.†	E.	10	20	32	3	0	10	17	1	0	10	15	6	0	12	17	29	0	0	0	J.
3.8	4.5	3.5	3.9	4,991	28	W.†	SW.	10	14	6	4	6	28	17	1	1	14	8	7	0	7	0	22	0	0	0	F.
3.4	6.1	3.7	4.3	4,924	66	W.	W.	4	17	4	1	1	18	43	5	0	13	14	4	0	4	0	23	0	0	0	M.
2.1	3.2	3.1	2.7	6,806	38	W.	W.	9	19	8	0	14	8	24	6	2	17	12	1	0	3	0	10	0	0	0	A.
3.0	5.0	4.9	4.3	7.508	39	E.	W.	7	18	9	4	3	20	24	7	1	13	14	4	0	8	0	2	0	3	0	M.
4.3	5.5	5.2	5.0	8,614	48	SW.	W.	8	10	2	1	1	22	34	12	0	8	13	9	0	2	0	0	0	0	0	J.
2.2	.....	3.0	2.6	7,305	44	SW.	SW.	4	11	0	2	5	17	16	6	1	19	7	5	0	1	0	0	12	2	0	J.
1.5	.....	2.5	2.0	7,137	46	E.	W.	5	17	0	1	0	7	26	5	1	23	6	2	0	0	0	0	12	1	0	A.
2.4	.....	3.3	2.8	6,452	36	E.	NE.	12	18	3	2	3	9	11	2	0	19	5	6	0	3	0	0	6	2	0	S.
2.4	.....	3.5	3.0	6,066	36	SW.†	W.	7	16	3	0	0	5	22	6	3	14	7	10	0	2	0	9	0	0	0	O.
4.8	.....	4.0	4.4	5,937	32	SW.	NE.	7	25	1	1	1	3	19	1	2	14	5	11	0	5	0	18	0	0	0	N.
4.9	.....	6.9	5.9	7,179	37	W.	NE.	9	30	1	1	3	3	13	1	1	8	7	16	0	5	2	25	0	0	0	D.
3.3	.....	4.0	3.8	78,724	.....	....	W.	92	215	69	20	37	150	266	53	12	172	113	81	0	52	19	138	30	8	0	Y.

Monthly and yearly meteorological summaries—Continued.

WOOD'S HOLL, MASS.

[Latitude, 41° 33′ N.; longitude, 70° 40′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
	In.	*In.*	*In.*	°	°	°	°	°	°	°	°	°	°	°	°					*In.*	*In.*
J.....	30.104	30.83	29.12	19.1	24.7	21.8	21.9	53	- 4	30.5	13.3	18	22	21	20	93	91	96	94	3.66	1.30
F....	30.047	30.44	29.52	25.0	31.7	28.0	28.2	48	0	36.1	20.5	23	29	27	26	92	91	95	93	1.79	0.52
M ...	29.948	30.56	28.90	28.7	34.8	31.2	31.6	52	13	38.4	23.7	24	26	26	25	81	70	84	78	4.63	1.21
A....	30.063	30.53	29.50	39.0	44.7	40.1	41.3	61	24	47.4	35.6	31	32	32	32	76	64	76	72	1.69	0.81
M ...	29.990	30.30	29.70	50.1	52.7	49.3	50.7	69	37	56.2	45.8	46	47	47	47	88	81	90	86	5.59	1.65
J.....	29.901	30.23	29.61	60.9	64.7	60.2	61.9	77	52	68.6	57.3	56	56	55	56	84	75	85	81	1.35	0.40
J.....	29.975	30.25	29.42	64.5	....	63.8	64.2	78	52	70.6	60.2	59	.....	60	59	83	.....	88	85	5.03	4.41
A....	29.934	30.23	29.55	66.4	....	66.0	66.2	79	56	73.0	62.3	61	.....	62	61	84	.....	86	85	1.36	0.51
S.....	30.048	30.60	29.20	59.2	....	58.9	59.0	76	39	65.0	55.1	56	.....	55	56	91	.....	88	90	11.27	6.55
O....	29.920	30.44	29.35	48.0	....	49.3	48.6	63	34	54.3	44.0	42	.....	42	42	80	.....	77	78	3.61	1.57
N....	30.092	30.78	29.29	44.3	....	44.8	44.6	61	24	50.6	39.9	39	.....	38	38	82	.....	79	80	6.22	1.76
D....	29.968	30.58	28.81	34.2	....	34.9	34.6	55	8	41.1	28.5	29	.....	30	29	81	.....	82	82	3.25	1.62
Y....	29.999	30.83	28.81	45.0	....	45.7	46.1	79	- 4	52.6	40.5	40	.....	41	41	85	.....	86	84	49.45	....

YANKTON, DAK.

[Latitude, 42° 54′ N.; longitude, 97° 28′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
J....	28.886	29.42	28.16	- 0.5	9.3	5.1	4.6	50	-28	15.8	- 5.5	- 6	2	0	- 2	76	71	78	75	0.37	0.12
F....	28.717	29.48	28.29	17.6	26.4	21.2	21.7	56	-19	33.3	11.5	13	16	15	14	82	66	78	75	0.41	0.16
M ...	28.760	29.27	28.04	17.3	29.7	23.5	23.5	69	-18	34.8	13.9	13	18	17	16	83	65	78	75	1.24	0.46
A....	28.758	29.23	28.12	39.1	57.3	48.1	48.2	85	24	63.0	37.0	33	35	37	35	80	48	68	65	2.16	0.76
M....	28.588	28.89	28.18	46.9	57.8	52.1	52.3	79	32	61.4	44.5	42	43	45	43	85	62	78	75	8.56	2.52
J....	28.526	28.91	28.10	61.5	75.7	68.6	68.6	95	43	79.3	58.8	56	58	59	58	81	56	72	70	1.03	0.28
J....	28.678	28.92	28.42	69.5	....	80.1	74.8	102	51	87.4	65.4	64	.....	67	65	82	.....	65	73	1.91	1.57
A ...	28.706	29.05	28.40	62.4	....	74.2	68.3	97	44	81.7	59.6	58	.....	63	61	88	.....	69	78	3.29	0.88
S....	28.756	29.08	28.36	52.8	....	65.7	59.2	93	35	75.6	49.8	47	.....	52	49	82	.....	61	71	0.50	0.40
O....	28.635	28.94	28.24	38.2	....	50.1	44.2	82	24	61.8	35.5	32	.....	37	34	80	.....	62	71	0.55	0.26
N....	28.799	29.26	28.31	27.8	....	36.4	32.1	79	9	48.0	24.3	23	.....	27	25	82	.....	70	76	0.19	0.11
D ...	28.740	29.20	28.23	23.3	....	29.4	26.4	65	6	38.3	19.9	17	.....	18	18	77	.....	66	72	0.68	0.46
Y ...	28.714	29.48	28.04	38.0	....	46.2	43.7	102	-28	56.7	34.6	33	.....	36	35	81	.....	70	73	20.89	....

YUMA, ARIZ.

[Latitude, 32° 45′ N.; longitude, 114° 36′ W.]

Months and year.	Pressure.			Temperature.								Dew point.				Relative humidity.				Precipitation.	
										Mean.											
	Mean.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	Maximum.	Minimum.	Maximum.	Minimum.	7 a. m.	3 p. m.	10 p. m.	Mean.	7 a. m.	3 p. m.	10 p. m.	Mean.	Total.	Max. 24 hours.
J.....	29.972	30.42	29.50	43.1	59.3	52.5	51.6	79	27	63.3	39.2	31	37	37	35	66	45	56	56	0.18	0.18
F ...	29.848	30.04	29.55	50.0	69.6	61.9	60.5	85	39	73.3	46.4	40	44	43	42	73	41	52	55	0.05	0.05
M ...	29.820	30.14	29.59	50.6	71.5	65.4	62.5	87	37	75.6	47.1	40	40	39	40	69	34	39	48	0.05	0.05
A ...	29.756	29.96	29.54	61.4	86.0	78.6	75.3	102	47	90.4	57.7	45	42	43	43	58	23	30	37	T.	T.
M ...	29.650	29.82	29.44	62.6	86.9	81.2	76.9	102	54	91.6	60.4	48	42	44	45	61	22	29	38	0.00	0.00
J.....	29.586	29.74	29.41	70.8	95.3	90.8	85.6	107	60	100.3	67.8	51	43	44	46	51	17	21	30	0.00	0.00
J.....	29.655	29.83	29.54	78.6	....	102.2	90.4	114	63	106.5	76.4	62	.....	56	59	57	.....	24	41	0.04	0.04
A ...	29.618	29.78	29.48	77.5	....	103.2	90.4	110	70	106.6	75.4	64	.....	58	61	63	.....	24	43	T.	T.
S.....	29.615	29.78	29.41	76.9	....	99.5	88.2	111	67	104.2	74.2	64	.....	60	62	66	.....	29	48	0.01	0.01
O ...	29.674	29.92	29.47	62.8	....	85.0	73.9	105	49	90.5	59.3	54	.....	55	54	74	.....	39	56	0.99	0.74
N ...	29.806	29.98	29.54	53.2	....	66.8	60.0	82	38	73.8	50.0	46	.....	50	48	79	.....	57	68	0.68	0.33
D ...	29.906	30.11	29.58	50.1	....	61.6	55.8	75	40	67.7	46.3	42	.....	47	44	76	.....	59	68	0.95	0.56
Y ...	29.742	30.42	29.41	61.5	....	79.1	72.6	114	27	87.0	58.4	49	.....	48	48	66	.....	38	49	2.95	....

Monthly and yearly meteorological summaries—Continued.

WOOD'S HOLL, MASS.

[*H*=22. *T*=51. *h*=39.]

Cloudiness (in tenths).				Wind.													Number of days.										
7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
5.4	5.9	3.9	5.0	15,808	54	NW.	NW.	11	2	4	10	0	7	22	36	1	9	12	10	0	11	18	31	0	0	0	J.
4.9	5.7	4.3	5.0	9,772	42	NW.†	NW.†	14	8	1	11	2	13	13	25	0	10	11	8	0	8	7	26	0	0	0	F.
4.2	5.3	4.4	4.7	13,956	48	NW.†	W.	16	11	3	6	8	12	19	18	0	12	9	10	0	10	8	25	0	0	0	M.
4.5	5.2	2.9	4.2	9,893	46	SW.	SW.	10	3	3	9	5	30	9	20	1	12	14	4	0	11	0	6	0	1	1	A.
5.1	6.6	5.8	5.8	8,926	36	SW.†	SW.	10	16	13	11	5	26	3	8	1	8	12	11	0	20	0	0	0	0	0	M.
3.5	4.4	3.0	3.7	8,670	42	SW.	SW.	10	8	7	7	4	39	8	7	0	13	15	2	0	12	0	0	0	3	0	J.
4.2	.....	4.0	4.1	10,253	48	SW.	SW.	3	8	5	1	2	29	7	7	0	18	5	8	0	7	0	0	0	0	0	J.
3.9	.....	3.6	3.8	10,894	48	SE.	SW.	3	4	5	5	1	29	7	8	0	14	10	7	0	10	0	0	0	1	0	A.
6.8	.....	5.0	5.9	9,414	72	N.	SE.	9	11	5	13	3	12	0	7	0	7	5	18	1	15	0	0	0	0	0	S.
5.4	....	5.4	5.4	13,001	48	W.	NW.	3	5	4	8	3	11	7	21	0	9	9	13	0	10	0	0	0	0	0	O.
5.2	.....	5.3	5.2	12,786	49	NW.	SW.	8	8	6	3	2	15	8	10	0	9	6	15	1	16	1	6	0	0	0	N.
4.7	.....	4.3	4.5	14,319	60	W.†	NW.	5	1	4	1	4	9	17	19	2	13	11	7	0	8	5	17	0	0	0	D.
4.8	.....	4.3	4.8	137,692	...	....	SW.	102	85	60	85	39	232	120	186	5	134	119	113	2	138	39	111	0	5	1	Y.

YANKTON, DAK.

[*H*=1,234. *T*=35. *h*=26.]

7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
3.9	5.2	3.9	4.3	6,742	54	NW.	NW.	23	0	3	12	16	6	7	24	2	13	12	6	0	7	25	31	0	0	0	J.
4.8	5.8	4.1	5.0	6,462	36	NW.	NW.	15	4	4	8	14	6	0	32	4	8	16	5	0	6	11	29	0	0	0	F.
5.2	6.1	4.6	5.4	7,451	36	N.	NW.	18	5	7	14	12	5	3	26	3	9	12	10	0	10	13	29	0	1	0	M.
4.8	5.7	3.2	4.5	7,621	48	S.	N.	26	10	4	20	12	3	4	10	1	11	13	6	0	9	0	11	0	3	0	A.
7.9	7.0	6.2	7.0	6,909	36	S.	NW.	12	12	16	13	5	6	4	24	1	3	11	17	0	20	0	0	0	3	0	M.
4.9	5.5	5.4	5.3	6,957	36	NW.	S.	7	0	5	24	27	3	7	16	1	6	19	5	0	7	0	0	5	3	0	J.
4.6	.....	3.2	3.9	5,070	34	N.	S.	6	5	4	11	16	6	1	10	3	13	12	6	0	6	0	0	13	2	0	J.
4.5	.....	4.1	4.3	4,283	36	NW.	S.†	9	5	2	7	19	5	5	6	4	15	6	10	0	12	0	0	5	9	0	A.
3.8	.....	3.2	3.5	5,060	28	NW.†	NW.	6	4	6	9	5	9	3	14	4	16	7	7	0	4	0	0	2	1	0	S.
3.7	.....	3.7	3.7	5,122	32	NW.	NW.	9	2	5	8	5	6	7	16	4	14	10	7	0	4	0	11	0	1	0	O.
4.4	.....	3.1	3.8	5,364	26	NW.	NW.†	8	1	3	4	14	8	5	14	3	14	9	7	0	5	5	24	0	1	0	N.
5.0	.....	3.1	4.0	5,728	25	NW.	NW.	3	4	0	6	6	9	7	25	2	16	5	10	0	6	12	29	0	0	0	D.
4.8	5.9	4.0	4.6	72,769	...	....	NW.	142	52	59	136	151	72	53	217	32	138	132	96	0	96	66	164	25	24	0	Y.

YUMA, ARIZ.

[*H*=141. *T*=16. *h*=1.]

7 a. m.	3 p. m.	10 p. m.	Mean.	Total (miles).	Maximum.	Direction.	Prevailing direction.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calms.	Clear.	Fair.	Cloudy.	Foggy.	Rain or snow.	Max. below 32°.	Min. below 32°.	Max. above 90°.	Thunder-storms.	Auroras.	Months and year.
1.2	3.3	1.9	2.1	5,809	32	N.	N.	39	19	10	5	11	0	4	5	0	21	9	1	0	2	0	4	0	0	0	J.
2.1	2.1	1.3	1.9	4,854	36	W.	S.	13	11	9	7	20	2	12	12	0	20	8	0	0	1	0	0	0	1	0	F.
1.1	3.4	1.7	2.1	5,648	46	S.	S.	12	11	7	7	27	9	15	5	0	21	9	1	0	1	0	0	0	3	0	M.
0.9	1.7	1.2	1.3	4,660	40	W.	W.	10	5	8	10	19	14	23	1	0	25	5	0	0	0	0	0	14	2	0	A.
1.2	0.9	1.3	1.1	5,395	26	W.	W.	2	5	4	6	21	18	28	9	0	28	3	0	0	0	0	0	16	1	0	M.
0.2	0.2	0.5	0.3	5,263	32	W.	S.	1	4	5	11	30	13	20	6	0	30	0	0	0	0	0	0	29	0	0	J.
2.7	.....	2.1	2.4	5,381	25	S.	S.	1	6	6	9	17	3	16	2	2	23	4	4	0	1	0	0	31	3	0	J.
0.9	.....	1.3	1.1	4,373	36	SW.	S.	3	5	8	5	13	12	12	3	1	27	2	2	0	0	0	0	31	2	0	A.
1.2	.....	1.4	1.3	3,918	36	S.	NE.	3	18	4	7	9	5	11	3	0	24	6	0	0	1	0	0	30	3	0	S.
1.2	.....	1.7	1.4	3,454	30	S.	E.	7	11	16	5	8	10	0	3	2	25	4	2	0	3	0	0	17	1	0	O.
2.8	.....	3.0	2.9	3,826	30	N.	N.	20	6	5	1	4	5	9	8	2	18	6	6	0	5	0	0	0	0	0	N.
2.1	.....	2.4	2.2	4,479	36	SW.	N.	26	12	3	4	7	0	6	3	1	20	5	6	0	4	0	0	0	0	0	D.
1.5	.....	1.7	1.7	57,060	...	....	S.	137	113	85	77	186	91	156	60	8	282	61	22	0	18	0	4	168	16	0	Y.

APPENDIX 18.

Monthly normal temperature and departure of 1888 *therefrom (in degrees Fahrenheit) at stations of the Signal Service, U. S. Army. The normal has been computed from the daily extremes of temperature for a period of nine years unless otherwise indicated by the figure in parenthesis on the right of the station.*

Stations.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.
Alabama:																								
Mobile	50.5	+ 1.7	56.2	+ 0.6	59.4	— 1.7	67.7	+ 1.1	77.4	— 2.2	80.4	— 2.4	82.2	+ 0.2	81.4	— 1.4	77.8	— 2.0	69.4	— 1.9	58.0	+ 1.4	51.5	— 0.5
Montgomery	48.2	+ 2.6	53.8	+ 0.4	57.4	— 0.8	66.4	+ 2.2	73.6	— 1.0	80.1	— 1.5	82.3	+ 0.4	80.7	+ 0.1	76.3	— 2.5	67.6	— 3.5	55.4	— 1.2	48.6	— 0.6
Arizona:																								
Apache, Fort	35.3	+ 0.1	40.0	+ 2.2	45.0	— 1.4	52.0	+ 4.6	60.0	— 0.2	68.8	+ 0.6	74.6	— 2.4	71.8	....	65.4	+ 4.4	55.4	+ 3.4	43.6	— 3.8	39.0	— 2.6
Bowie, Fort (5)	42.2	+ 1.1	47.4	— 1.0	52.2	— 4.0	60.1	+ 2.3	68.8	— 2.0	77.6	+ 1.0	80.7	— 2.0	77.4	+ 0.4	70.6	+ 0.8	63.2	+ 0.3	51.6	— 1.6	45.3	— 3.1
Grant, Fort	43.5	+ 0.8	46.3	+ 0.9	51.8	— 3.1	58.0	+ 3.9	66.6	— 2.1	76.0	— 0.2	78.6	+ 0.6	76.1	+ 3.0	71.5	+ 1.1	62.6	+ 2.0	51.6	— 0.8	46.2	— 1.6
McDowell, Fort	48.4	— 2.0	53.4	— 0.1	58.4	— 2.8	64.8	+ 6.4	75.0	— 0.8	82.4	— 2.0	91.2	— 0.6	89.3	+ 0.8	82.4	+ 3.0	69.9	0.0	57.2	+ 1.0	49.4	+ 2.0
Phœnix (6)	49.0	....	53.7	....	61.3	....	66.1	+ 4.8	73.2	— 3.4	81.4	+ 2.6	88.9	+ 1.9	86.7	+ 1.2	79.8	+ 3.3	70.0	....	61.1	+ 8.2	54.8	....
San Carlos (8)	49.4	— 5.8	50.2	+ 0.6	54.6	— 3.2	62.4	+ 3.8	70.8	+ 0.6	79.9	+ 1.5	86.1	+ 1.5	84.6	+ 1.0	75.8	+ 6.0	64.0	....	50.2	+ 1.6	45.5	+ 0.7
Thomas, Fort	41.4	+ 3.2	47.5	+ 2.1	54.0	0.0	60.4	+ 6.1	69.4	— 0.4	79.0	+ 2.0	84.9	+ 2.5	82.4	+ 2.3	74.4	+ 5.3	61.6	+ 3.2	49.4	+ 4.2	43.7	+ 2.7
Verde, Fort	40.8	— 3.2	47.4	+ 1.4	52.0	— 2.3	59.0	+ 4.4	67.6	— 1.2	74.8	+ 0.4	82.6	+ 0.8	80.1	+ 0.1	73.4	+ 3.2	62.8	+ 0.5	48.8	+ 2.2	42.6	+ 1.6
Whipple Barracks	34.5	— 6.5	38.2	+ 3.0	43.6	— 3.0	50.4	+ 4.4	58.8	— 0.6	66.8	+ 0.2	73.4	+ 0.8	71.2	— 1.1	64.7	+ 2.9	53.4	+ 2.5	42.2	+ 1.6	38.4	— 0.5
Wilcox (5)	42.9	+ 0.2	46.8	+ 0.6	49.4	— 3.4	55.8	+ 5.8	64.4	+ 0.1	73.6	+ 0.2	80.6	— 2.1	78.2	— 1.9	71.0	+ 0.5	61.2	+ 0.4	48.6	— 3.8	44.2	— 0.2
Yuma	53.5	— 2.3	57.9	+ 1.9	63.8	— 2.4	69.8	+ 4.2	77.5	— 1.5	85.0	— 1.0	91.8	— 0.4	91.1	— 0.1	84.9	+ 4.3	72.4	+ 2.5	61.2	+ 0.7	54.3	+ 2.7
Arkansas:																								
Fort Smith (6)	33.4	+ 1.7	41.9	+ 3.2	50.8	— 1.8	62.6	+ 3.2	69.7	— 1.3	77.6	— 0.8	82.0	0.0	79.7	+ 0.3	74.3	— 2.9	63.4	— 3.5	51.2	— 2.4	41.0	+ 2.8
Little Rock	40.0	— 1.2	46.6	— 0.4	53.3	— 3.3	63.6	+ 2.8	70.8	— 2.0	78.1	— 2.3	81.5	+ 0.4	80.0	0.0	73.7	— 2.5	64.0	— 5.2	51.0	— 1.1	43.7	+ 0.6
California:																								
Los Angeles	53.0	— 3.3	54.6	— 0.1	56.8	— 1.2	60.0	+ 3.2	64.2	— 1.4	68.0	+ 1.2	71.6	+ 1.8	72.4	+ 0.6	69.6	+ 4.2	63.4	+ 2.6	58.6	+ 1.3	55.8	+ 1.6
Red Bluff	45.6	— 4.9	49.1	+ 4.2	55.0	— 1.4	59.5	+ 6.4	67.2	+ 0.4	73.9	— 3.7	81.0	+ 0.2	79.6	+ 2.8	74.4	+ 5.8	63.0	+ 4.0	52.4	+ 1.6	47.7	+ 0.3
Sacramento	45.7	— 2.9	49.5	+ 3.5	55.0	— 1.4	58.7	+ 4.3	64.4	— 1.7	69.3	— 1.3	73.5	— 0.1	73.5	+ 3.3	70.8	+ 4.6	61.6	+ 3.6	52.4	+ 1.6	48.0	— 0.4
San Diego	53.2	— 1.7	54.2	+ 0.2	56.0	— 0.5	59.0	+ 2.4	62.0	— 0.1	65.1	+ 1.3	67.8	+ 0.6	69.5	— 0.3	67.2	+ 2.5	62.4	+ 2.6	58.1	+ 1.8	56.2	+ 2.0
San Francisco	50.0	— 3.3	51.8	+ 2.1	54.0	— 0.6	55.6	+ 2.2	58.0	— 1.1	59.4	+ 3.0	59.9	+ 1.5	59.4	+ 1.4	61.1	+ 1.5	59.6	+ 2.0	55.8	+ 1.2	52.6	+ 0.6
Colorado:																								
Denver	28.8	— 0.6	32.3	+ 6.7	39.1	— 5.3	47.9	+ 5.3	56.6	— 2.8	67.1	+ 0.7	72.6	+ 1.6	70.2	— 2.2	62.4	+ 0.4	50.4	+ 0.6	37.6	— 0.6	33.6	+ 3.6
Pike's Peak	1.6	+ 3.4	4.0	+ 4.2	8.1	+ 0.7	14.8	+ 7.0	23.4	— 1.1	34.2	+ 1.7	41.2	+ 2.4	39.2	— 1.6	32.6	+ 2.8	21.5	....	10.8	....	6.6	....
Connecticut:																								
New Haven	25.7	— 5.1	28.6	— 0.8	33.0	— 3.5	45.5	— 2.2	57.2	— 1.6	66.1	+ 1.9	71.4	— 2.6	69.4	+ 1.0	63.6	— 2.5	52.2	— 4.6	41.4	+ 1.6	81.6	+ 1.2
New London	28.0	— 4.6	30.2	0.0	34.3	— 2.0	45.8	— 0.8	56.4	— 0.8	65.2	+ 2.2	70.6	— 2.2	69.0	+ 1.4	63.5	— 2.6	53.2	— 3.9	43.2	+ 1.6	33.2	+ 2.0
Dakota:																								
Bismarck	1.4	— 7.0	9.6	+ 1.9	20.8	— 8.0	41.4	+ 1.4	55.7	— 7.3	65.0	— 2.0	69.5	+ 0.2	67.2	— 2.6	57.0	+ 2.0	43.9	— 0.5	27.4	+ 2.0	13.8	+ 9.4
Buford, Fort	1.0	— 7.8	9.0	+ 4.2	23.4	— 9.1	42.2	— 0.1	55.4	— 5.8	65.4	— 2.8	69.4	— 0.3	67.5	— 3.5	56.4	+ 3.0	43.0	+ 0.8	26.4	+ 1.2	12.4	+ 9.6
Huron	4.2	— 5.5	12.4	+ 2.2	28.0	— 8.2	46.0	— 0.2	55.8	— 5.3	67.0	— 0.6	71.6	+ 1.9	68.8	— 1.4	59.8	— 0.4	46.8	— 2.2	30.8	+ 1.8	17.6	+ 6.6

Yankton	11.9	− 6.7	19.4	+ 3.0	30.6	− 6.2	47.6	+ 2.4	60.0	− 7.0	70.0	− 1.0	74.4	+ 2.0	72.0	− 1.4	62.9	− 0.2	50.2	− 1.6	33.6	+ 2.6	21.2	+ 7.9
Yates, Fort (6)	0.7	− 5.5	9.4	+ 5.8	25.1	− 8.6	46.3	+ 0.6	56.7	− 6.0	70.8	− 4.7	73.7	− 0.9	70.4	− 2.8	60.8	+ 1.0	46.8	+ 0.2	30.5	− 1.1	16.3	+10.0
District of Columbia:																								
Washington City	31.8	− 1.7	36.5	− 0.3	40.2	− 2.2	52.9	+ 0.5	64.6	− 1.6	72.6	+ 0.2	76.8	− 3.2	74.6	+ 1.2	68.9	− 4.1	57.8	− 5.2	45.4	+ 2.0	35.8	+ 1.7
Florida:																								
Cedar Keys	56.5	+ 3.1	61.4	+ 0.6	62.8	− 1.3	70.0	+ 0.8	75.8	− 0.2	80.5	− 0.3	82.3	− 0.1	81.8	− 0.7	79.5	− 2.3	73.0	− 1.4	63.4	0.0	57.2	− 2.3
Jacksonville	56.2	+ 1.8	60.7	+ 0.3	62.6	− 1.7	69.5	+ 1.8	75.2	+ 0.4	80.8	− 0.2	83.0	− 1.1	81.8	+ 0.7	78.3	− 1.3	71.8	− 1.9	62.2	− 0.6	56.5	− 2.9
Key West	70.9	+ 0.9	72.3	− 0.1	73.1	− 1.8	76.8	− 1.6	79.8	− 2.0	83.2	− 1.5	85.1	− 3.0	84.6	− 1.2	82.8	− 1.4	79.2	− 0.8	74.8	− 0.9	70.2	− 3.4
Pensacola	52.6	+ 3.4	57.6	+ 1.2	60.4	− 0.8	67.8	+ 0.6	74.3	− 1.7	80.0	− 1.6	81.8	+ 0.4	81.2	− 1.3	78.0	− 1.8	70.4	− 1.4	59.2	+ 0.7	58.8	− 1.5
Georgia:																								
Atlanta	42.6	+ 2.0	48.4	+ 0.5	51.9	− 0.9	61.6	+ 2.6	69.1	− 0.5	75.6	+ 0.2	78.6	+ 0.6	76.9	+ 1.6	71.8	− 3.0	62.8	− 4.6	51.3	+ 1.1	43.8	− 0.3
Augusta	47.0	+ 1.2	52.6	− 0.5	55.6	− 1.2	64.5	+ 2.7	72.9	− 0.2	79.1	+ 0.8	82.4	− 0.2	80.6	+ 1.0	76.0	− 2.8	65.9	− 3.7	54.4	+ 0.4	48.0	− 1.8
Savannah	51.4	+ 2.0	56.3	+ 0.1	58.8	− 1.6	66.4	+ 1.0	73.8	+ 0.1	79.6	− 0.5	82.6	− 1.8	80.7	− 0.1	76.2	− 1.6	67.8	− 2.2	58.2	− 0.4	52.2	− 2.5
Idaho:																								
Boisé City	28.2	−10.8	34.1	+ 5.5	43.0	− 0.7	50.4	+ 5.2	58.8	+ 0.6	65.8	− 1.3	73.0	+ 0.3	71.4	+ 1.4	61.2	+ 6.8	50.0	+ 3.2	38.5	+ 0.3	34.0	+ 3.0
Illinois:																								
Cairo	33.0	− 0.5	39.8	− 2.2	46.6	− 1.8	59.4	+ 2.5	67.8	− 3.4	75.0	− 1.6	79.1	+ 0.9	77.4	− 1.4	70.6	− 3.2	60.2	− 4.4	46.6	+ 0.1	37.7	+ 1.7
Chicago	21.6	− 6.8	27.2	− 4.6	34.1	− 4.2	46.6	− 0.2	56.7	− 3.6	65.8	+ 1.4	72.0	+ 0.6	70.5	− 1.1	64.4	− 4.6	53.2	− 4.1	39.6	+ 2.0	29.5	+ 2.7
Springfield	25.2	− 7.3	32.2	− 4.5	39.8	− 4.0	53.6	0.0	63.5	− 4.4	71.5	− 1.3	76.7	− 0.3	74.0	− 2.6	66.8	− 3.8	55.5	− 4.6	42.5	− 0.5	32.2	+ 2.0
Indiana:																								
Indianapolis	26.3	− 2.1	32.4	− 1.8	38.6	− 2.7	52.4	+ 0.6	63.6	− 2.8	71.6	+ 1.1	75.7	+ 0.1	73.2	− 0.4	66.6	− 3.4	54.8	− 4.3	41.0	+ 3.0	31.4	+ 3.9
Indian Territory:																								
Reno, Fort (6)	28.6	+ 1.1	37.9	+ 3.8	48.6	− 2.2	59.8	+ 2.8	67.4	− 1.7	75.0	+ 1.4	80.6	0.0	79.0	+ 0.8	72.8	− 0.9	60.8	− 0.5	49.8	− 3.6	35.7	+ 7.1
Sill, Fort	35.2	− 1.6	42.2	+ 2.0	51.0	− 4.0	62.7	+ 0.1	70.0	− 3.6	78.1	− 1.3	82.0	− 2.0	80.8	− 1.4	73.2	− 2.8	61.4	− 2.1	47.4	− 0.6	41.1	+ 3.3
Supply, Fort (5)	29.6	+ 1.8	39.0	+ 5.2	46.1	− 1.9	57.6	+ 4.0	66.0	− 3.0	77.2	+ 0.8	81.3	+ 1.2	79.8	− 0.7	72.0	− 0.4	59.2	− 0.8	46.6	+ 1.3	38.6	+ 6.1
Iowa:																								
Davenport	18.4	− 8.1	25.3	− 4.1	33.9	− 3.5	49.8	+ 0.1	61.0	− 5.4	69.8	+ 0.3	74.6	+ 1.6	72.1	− 0.8	64.8	− 4.0	52.8	− 3.4	38.6	+ 1.5	27.2	+ 4.8
Des Moines	15.5	− 8.3	23.2	− 0.1	34.4	− 4.2	50.6	+ 0.6	62.0	− 6.7	70.8	− 2.0	76.0	+ 1.1	73.2	− 1.9	64.6	− 3.3	52.6	− 2.8	37.0	+ 1.8	24.8	+ 5.6
Dubuque	15.0	− 7.9	22.0	− 3.5	31.8	− 5.4	48.8	− 0.8	60.6	− 6.6	69.2	− 0.1	74.0	+ 1.4	71.2	− 0.4	63.0	− 3.4	51.2	− 2.7	36.0	+ 3.0	24.2	+ 5.7
Keokuk	20.9	− 6.3	28.4	− 2.2	37.4	− 2.3	52.6	+ 1.0	63.0	− 4.6	71.4	− 0.6	76.8	+ 0.8	74.4	− 2.3	67.1	− 4.3	54.4	− 3.0	40.4	+ 1.4	28.7	+ 5.3
Kansas:																								
Dodge City	24.7	− 1.3	32.2	+ 7.1	42.2	− 4.8	54.2	+ 3.4	63.4	− 1.9	73.6	0.0	78.0	+ 2.0	75.5	− 1.1	68.2	− 0.4	55.5	− 0.4	40.0	+ 1.2	31.8	+ 6.6
Leavenworth	23.3	− 6.5	31.1	+ 1.3	41.2	− 3.4	55.1	+ 2.2	65.0	− 4.2	73.6	− 0.8	78.2	+ 1.8	75.8	− 1.6	68.4	− 1.4	56.5	− 2.0	41.6	− 0.9	31.2	+ 4.6
Kentucky:																								
Louisville	33.8	− 1.2	39.6	− 1.6	44.8	− 1.6	57.3	+ 1.5	67.2	− 2.6	74.4	+ 0.9	78.4	+ 0.2	76.8	− 0.8	70.3	− 4.1	59.4	− 5.4	46.6	+ 2.0	37.6	+ 1.3
Louisiana:																								
New Orleans	53.5	+ 3.0	59.2	− 0.2	62.2	− 1.2	69.6	+ 1.2	75.1	− 0.5	80.9	− 1.7	82.8	+ 0.8	82.0	− 1.0	78.6	− 1.0	71.3	− 0.5	60.6	+ 1.2	55.2	− 1.4
Shreveport	45.0	+ 0.2	51.8	+ 1.0	58.4	− 2.9	68.0	+ 1.3	74.7	− 2.5	81.6	− 3.0	84.2	− 1.4	83.0	− 1.2	77.0	− 3.0	67.3	− 1.7	55.6	− 0.6	47.8	+ 1.9
Maine:																								
Eastport	20.2	− 6.4	22.0	+ 0.4	27.4	+ 1.2	38.2	− 1.9	47.2	− 2.0	55.7	− 0.5	60.5	− 1.9	60.8	− 1.6	55.6	− 2.0	46.5	− 2.8	37.0	+ 0.1	26.3	+ 1.9
Portland	22.0	− 7.7	25.4	− 3.1	31.5	− 2.7	43.7	− 5.4	54.4	− 5.8	64.2	− 1.2	69.0	− 3.8	67.2	− 1.6	60.1	− 4.3	48.7	− 5.3	39.2	− 1.0	28.6	+ 1.1
Maryland:																								
Baltimore	32.8	− 3.6	37.0	− 1.3	40.6	− 3.4	53.1	− 0.5	64.8	− 2.0	73.1	+ 0.1	77.6	− 3.0	75.0	+ 1.2	69.0	− 3.7	58.3	− 5.6	46.4	+ 1.5	36.9	+ 0.7
Massachusetts:																								
Boston	25.4	− 5.3	28.2	+ 0.1	32.9	− 0.7	45.0	− 2.4	56.1	− 3.0	66.2	+ 0.4	71.4	− 2.6	69.5	+ 0.6	62.9	− 3.1	51.7	− 4.0	42.0	+ 1.8	31.9	+ 2.7
Michigan:																								
Alpena	15.4	− 2.4	16.8	0.0	21.4	− 3.3	36.7	− 1.9	49.8	− 5.1	59.8	+ 2.5	65.0	− 1.2	63.0	+ 0.2	56.8	− 2.6	45.4	− 3.0	33.0	+ 2.2	24.1	+ 3.2
Detroit	23.6	− 4.6	27.8	− 3.6	32.6	− 4.0	46.0	− 2.8	58.6	− 4.2	67.4	+ 0.3	72.2	− 1.2	69.6	− 0.6	63.7	− 3.8	52.4	− 5.6	40.0	+ 1.4	30.4	+ 1.0
Escanaba	11.2	− 3.7	13.6	− 1.6	20.4	− 5.6	35.9	− 0.7	50.0	− 4.2	60.5	+ 0.3	66.3	+ 1.9	63.2	+ 2.5	56.6	0.0	45.0	− 0.8	31.7	+ 4.5	22.0	+ 5.8
Grand Haven	22.5	− 4.9	24.6	− 2.9	29.6	− 4.7	44.0	− 1.8	55.1	− 4.8	63.4	0.0	68.0	0.0	66.4	− 1.6	60.7	− 5.5	50.0	− 4.2	38.2	+ 0.9	28.4	+ 3.9
Marquette	13.3	− 5.3	15.3	− 3.5	20.6	− 6.4	36.2	− 2.6	49.3	− 5.9	58.0	+ 1.0	64.2	0.0	62.0	− 0.4	56.4	− 2.6	45.2	− 3.1	31.6	+ 3.4	22.5	+ 3.9
Port Huron	19.6	− 4.0	22.8	− 0.4	27.3	− 1.9	41.2	− 1.0	53.4	− 1.8	63.3	+ 1.6	68.4	− 1.0	66.7	− 0.3	61.4	− 4.0	49.4	− 4.3	36.6	+ 4.2	26.8	+ 4.8

Monthly normal temperature and departure of 1888 *therefrom* (*in degrees Fahrenheit*) *at stations of the Signal Service, etc.*—Continued.

Stations.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.	Normal.	Departure, + or —.
Minnesota:																								
Duluth	6.0	— 3.7	12.4	+ 0.3	21.9	— 6.3	37.7	— 0.8	48.6	— 5.1	58.0	— 2.4	66.0	— 1.1	64.2	— 0.4	56.1	— 0.5	45.2	— 1.6	29.4	+ 4.8	16.7	+ 8.0
Moorhead	—4.8	— 3.0	4.2	+ 0.2	18.6	— 6.2	40.0	— 1.8	53.8	— 6.5	64.3	— 0.2	67.8	+ 1.2	65.3	— 2.1	56.2	+ 0.4	43.1	— 0.1	24.8	+ 4.4	9.7	+10.5
St. Paul	7.9	— 8.3	15.6	— 2.4	27.4	— 8.6	46.2	— 4.6	58.6	— 8.4	68.1	— 1.3	72.4	+ 0.7	69.6	— 2.2	60.1	— 2.1	48.0	— 2.8	31.3	+ 4.7	18.0	+ 6.8
St. Vincent	—9.6	— 4.2	—0.6	+ 1.2	13.2	— 5.6	36.2	— 1.4	52.0	— 7.0	62.2	— 0.3	65.2	+ 0.8	62.8	— 2.0	53.4	+ 1.2	40.0	+ 1.2	20.6	+ 4.4	5.0	+10.4
Mississippi:																								
Vicksburg	46.8	— 0.1	53.7	— 0.3	58.4	— 2.4	66.8	+ 2.2	73.5	— 1.2	79.8	— 1.8	82.2	+ 0.6	81.4	0.0	76.4	— 2.4	67.3	— 2.7	55.6	+ 0.9	49.8	0.0
Missouri:																								
St. Louis	29.0	— 3.8	35.8	— 2.8	43.0	— 2.0	57.4	+ 2.0	66.6	— 3.4	74.7	— 1.0	79.8	0.0	77.6	— 2.8	70.4	— 3.8	58.7	— 3.7	45.0	— 0.2	35.0	+ 3.2
Montana:																								
Assinaboine, Fort	7.2	— 6.8	14.2	+ 6.7	29.8	—11.0	43.8	+ 2.0	53.4	— 2.6	63.0	— 3.0	67.6	+ 1.0	65.6	— 0.1	55.4	+ 5.6	42.8	+ 3.2	29.4	— 0.2	18.8	+ 7.2
Custer, Fort	13.8	— 9.8	21.4	+ 6.7	33.6	—10.6	46.2	+ 3.4	55.4	— 3.7	65.0	— 2.4	71.5	— 0.5	70.0	— 2.2	59.0	+ 3.2	47.0	+ 1.4	32.1	— 5.6	22.8	+ 4.7
Helena	15.0	— 8.0	22.8	+12.1	33.7	— 9.9	43.4	+ 5.9	50.0	— 1.0	60.4	— 0.8	66.7	+ 1.5	66.4	+ 0.2	56.8	+ 5.8	43.7	+ 4.5	30.2	— 5.5	24.0	+ 0.9
Maginnis, Fort (6)	15.2	— 3.2	20.0	+10.3	30.4	— 8.8	41.4	+ 4.1	50.2	— 4.9	59.0	— 4.6	65.6	— 1.2	64.2	— 1.6	54.5	+ 5.1	43.0	+ 1.6	34.0	+ 0.6	24.6	+10.6
Poplar River (5)	—5.0	— 4.5	2.8	+ 7.3	24.4	—14.8	42.6	— 3.0	55.2	— 4.6	65.6	— 2.8	68.9	— 0.7	65.4	— 0.7	55.8	+ 3.8	43.2	+ 1.0	26.0	+ 1.0	8.0	+13.2
Nebraska:																								
North Platte	18.8	— 5.3	25.7	+ 6.7	36.0	— 7.8	49.4	+ 3.0	59.4	— 4.6	69.4	— 0.3	74.4	+ 1.1	72.0	— 2.8	63.3	+ 0.3	50.4	— 1.8	35.6	+ 0.8	26.6	+ 4.2
Omaha	15.7	— 7.5	24.3	+ 2.5	35.2	— 5.4	51.6	+ 2.3	62.8	— 5.4	72.0	— 1.7	76.8	+ 2.4	73.8	— 1.4	65.6	— 1.6	53.6	— 2.4	37.8	+ 1.9	25.3	+ 7.0
New Hampshire:																								
Mount Washington	5.5	....	6.7	....	8.6	....	21.1	....	35.4	....	44.2	....	47.6	— 2.8	46.3	— 1.4	40.4	— 3.0	30.2	....	18.1	....	10.4	....
New Jersey:																								
Atlantic City	31.3	— 1.5	33.8	— 0.4	36.9	— 3.2	46.9	— 0.3	57.4	— 1.0	67.0	+ 0.6	72.9	— 2.7	71.8	+ 0.4	67.4	— 2.2	56.8	— 5.6	45.2	+ 2.0	35.6	+ 0.6
New Mexico:																								
Santa Fé	27.2	+ 2.8	33.0	+ 2.8	39.2	— 1.0	46.0	+ 4.6	56.0	— 2.2	66.1	+ 0.7	69.6	+ 0.6	66.7	— 0.9	60.0	+ 3.0	50.2	+ 0.8	37.2	+ 0.4	31.4	+ 1.9
New York:																								
Albany	22.2	— 7.1	25.7	— 3.4	31.4	— 5.4	46.7	— 3.2	60.3	— 2.7	68.7	+ 0.5	73.2	— 2.4	71.2	0.0	63.9	— 2.7	51.5	— 5.9	40.6	0.0	29.2	+ 0.6
Buffalo	22.7	— 4.5	25.0	— 1.1	28.3	— 2.5	41.0	— 2.0	54.5	— 0.7	63.8	+ 0.9	68.8	— 0.9	67.8	0.0	62.2	— 3.2	50.4	— 5.3	39.0	+ 1.6	29.6	+ 1.2
New York City	29.6	— 3.6	32.0	— 0.2	35.8	— 2.9	48.4	0.0	60.0	— 0.7	69.2	+ 2.6	74.0	— 1.4	72.4	+ 2.4	67.0	— 0.8	56.0	— 4.8	44.8	+ 2.0	34.6	+ 1.4
Oswego	22.3	— 6.9	24.7	— 2.9	28.8	— 5.0	41.8	— 3.8	55.2	— 2.9	63.7	— 0.4	69.4	— 3.6	68.0	— 1.1	62.0	— 4.2	49.2	— 5.1	39.2	+ 0.2	28.6	+ 1.0
Rochester	22.6	— 4.8	25.0	+ 0.2	28.7	— 3.2	42.6	— 1.6	56.8	— 2.2	65.0	+ 1.6	69.6	— 1.8	68.1	— 0.5	62.8	— 4.8	49.9	— 5.7	38.6	+ 1.8	28.5	+ 1.5
North Carolina:																								
Charlotte	40.8	+ 2.0	46.6	0.0	49.7	0.0	59.8	+ 3.4	69.0	— 0.2	75.6	+ 1.6	79.0	0.0	77.0	+ 2.0	71.4	— 2.4	61.2	— 3.9	50.2	+ 1.8	44.0	— 1.2
Hatteras	43.9	+ 2.2	47.3	— 0.4	49.0	— 1.0	56.6	+ 0.3	66.4	+ 0.4	73.6	— 0.8	78.0	— 3.0	77.4	+ 0.5	74.2	— 0.9	66.0	— 4.8	56.0	+ 1.4	47.4	— 1.2
Kitty Hawk	42.2	+ 2.4	45.5	+ 0.6	47.6	+ 0.9	54.8	+ 2.9	65.8	+ 2.8	73.6	+ 2.2	78.6	— 2.0	77.4	+ 6.3	73.2	— 1.6	64.4	— 4.2	53.7	+ 4.2	45.1	+ 1.4
Southport	45.6	+ 0.8	49.3	+ 0.3	51.9	— 0.5	60.1	+ 1.5	70.4	+ 4.0	76.2	— 1.4	79.8	— 1.9	78.5	+ 1.7	73.9	+ 0.3	64.9	— 2.0	54.4	+ 2.8	47.2	— 0.8
Wilmington	47.0	— 0.3	51.5	— 0.9	53.4	— 2.4	61.5	+ 0.1	70.4	— 0.3	76.6	+ 0.2	80.2	— 2.8	78.6	— 0.4	74.2	— 1.4	65.3	— 2.7	55.4	+ 1.6	48.4	— 1.6
Ohio:																								
Cincinnati	31.6	— 2.4	37.3	— 2.3	42.3	— 3.6	54.2	+ 0.6	65.4	— 2.2	73.2	+ 0.6	77.6	— 0.5	75.2	— 1.0	69.2	— 4.4	57.5	— 5.5	44.5	+ 1.9	35.6	+ 1.4

Cleveland	24.4	— 2.5	28.6	— 0.8	32.2	— 1.0	45.2	— 0.1	58.2	— 1.3	66.6	+ 1.3	71.0	— 0.4	69.4	+ 1.2	64.2	— 3.6	53.0	— 5.0	40.0	+ 3.4	30.1	+ 3.7
Columbus	27.5	— 0.7	33.0	0.0	37.8	— 1.3	51.0	+ 0.2	63.1	— 2.5	70.6	+ 1.0	75.0	— 1.8	72.2	— 0.8	66.2	— 4.9	54.6	— 5.9	41.2	+ 2.9	32.3	+ 1.9
Sandusky	24.9	— 3.5	29.2	— 2.0	33.6	— 2.0	46.2	+ 0.2	60.0	— 3.8	68.7	+ 0.8	73.6	— 1.2	71.4	+ 0.2	65.6	— 4.0	53.6	— 5.7	40.7	+ 2.7	30.6	+ 2.5
Toledo	24.2	— 4.8	28.9	— 2.7	34.2	— 3.9	46.8	— 0.9	59.8	— 4.4	68.5	+ 0.3	73.2	— 1.0	70.4	— 0.2	64.6	— 4.7	52.8	— 5.2	40.4	+ 2.3	30.0	+ 2.6
Oregon:																								
Klamath, Fort (5)	24.8	— 8.2	28.4	+ 3.6	37.2	— 4.2	43.2	+ 2.7	50.0	+ 0.2	53.4	— 1.5	59.0	+ 0.3	58.4	+ 1.8	51.0	+ 6.8	44.0	+ 1.6	33.9	+ 1.7	32.4	+ 1.6
Linkville	30.6	—10.5	34.4	+ 3.2	41.3	— 3.0	47.2	+ 3.6	55.4	— 0.9	57.4	— 1.8	66.6	— 2.8	....	....	56.8	+ 6.8	48.2	+ 1.4	39.0	— 1.2	34.7	+ 1.1
Portland	38.4	— 9.1	40.3	+ 3.5	47.7	— 1.4	52.6	+ 2.7	58.9	+ 3.5	63.0	— 0.1	67.7	— 0.1	66.3	+ 2.7	61.6	+ 4.4	53.5	+ 2.8	45.1	— 1.1	42.8	+ 0.9
Roseburgh	40.7	— 6.0	42.0	+ 3.8	47.8	— 0.9	51.8	+ 3.7	57.4	+ 2.3	61.4	0.0	66.4	+ 0.8	66.0	+ 2.7	61.8	+ 4.5	53.2	+ 3.8	45.2	+ 1.8	43.8	+ 3.1
Pennsylvania:																								
Erie	26.0	— 3.5	28.6	— 0.6	31.6	— 3.4	44.2	— 1.6	57.4	— 2.1	66.0	+ 0.7	70.8	— 2.0	69.3	— 0.9	63.9	— 4.5	53.1	— 5.7	41.3	+ 2.3	32.0	+ 1.5
Philadelphia	31.0	— 3.2	35.4	— 1.5	38.4	— 3.2	51.0	0.0	62.8	— 1.6	71.6	+ 1.8	76.4	— 2.5	74.1	+ 1.7	68.6	— 2.8	57.2	— 5.6	45.6	+ 1.8	35.7	+ 1.4
Pittsburgh	30.2	— 2.0	34.5	+ 0.1	38.0	— 1.0	51.4	— 1.2	63.9	— 2.1	71.2	+ 0.7	75.2	— 2.8	73.0	— 1.0	67.4	— 5.8	55.5	— 5.7	43.1	+ 2.2	34.2	+ 1.6
Rhode Island:																								
Block Island	29.8	— 5.3	31.2	— 1.6	34.0	— 3.2	43.8	— 2.6	52.4	— 2.9	62.4	+ 0.2	68.8	— 3.7	68.2	— 0.4	63.5	— 2.7	54.2	— 4.5	45.4	0.0	36.2	— 0.8
Narragansett Pier (6)	27.1	— 3.7	29.1	+ 0.5	32.4	— 0.5	44.2	— 1.7	54.0	— 0.4	64.6	+ 0.8	70.2	— 3.4	68.4	+ 0.5	62.2	— 1.0	52.8	— 4.5	43.0	+ 0.5	32.8	+ 1.2
South Carolina:																								
Charleston	49.9	+ 1.4	54.6	+ 0.2	56.9	— 1.5	64.5	+ 2.3	73.1	+ 0.1	79.3	— 0.1	82.2	— 2.0	80.8	+ 0.6	76.4	— 1.1	68.1	— 2.1	57.8	— 0.1	51.2	— 2.0
Tennessee:																								
Chattanooga	40.7	+ 1.9	46.5	+ 0.9	50.8	— 1.1	61.2	+ 2.7	68.8	— 1.5	75.5	— 0.1	78.6	+ 1.3	77.4	+ 0.5	71.6	— 3.0	61.8	— 4.5	49.9	+ 3.1	41.8	+ 1.3
Knoxville	38.3	+ 2.3	44.1	+ 1.8	47.8	— 0.5	58.6	+ 2.8	67.2	— 1.2	74.2	— 0.2	76.8	+ 0.5	76.0	+ 0.8	70.6	— 3.7	60.4	— 5.7	47.6	+ 2.4	39.0	+ 0.4
Memphis	38.8	— 0.3	45.6	— 1.2	51.8	— 1.9	62.9	+ 2.9	70.7	— 1.7	78.0	— 1.8	81.2	+ 1.3	79.5	— 0.2	73.2	— 2.6	63.5	— 4.5	49.9	+ 0.8	42.8	+ 0.8
Nashville	37.4	— 0.5	43.2	— 1.5	48.5	— 1.3	59.8	+ 2.6	68.4	— 2.0	75.6	— 0.4	78.9	+ 0.9	78.0	+ 0.4	71.5	— 3.4	61.4	— 5.0	48.4	+ 1.2	40.0	+ 0.4
Texas:																								
Brownsville	57.0	— 1.8	63.3	+ 2.5	67.9	— 2.1	74.4	+ 0.4	78.7	— 0.3	82.4	— 1.0	83.7	— 0.3	83.4	+ 0.4	80.2	— 0.8	75.8	+ 0.6	65.9	+ 1.1	61.3	+ 2.1
Davis, Fort	43.2	+ 1.8	48.4	— 0.3	53.5	— 3.1	60.7	+ 1.3	68.5	— 2.0	76.3	— 0.5	76.8	— 1.8	74.0	— 0.4	68.2	— 1.6	61.2	+ 0.2	50.5	— 1.1	45.8	+ 0.8
Elliott, Fort	31.5	— 1.1	38.2	+ 3.8	46.6	— 4.6	57.0	+ 2.5	64.6	— 1.9	74.1	+ 1.9	78.0	+ 1.9	76.0	0.0	69.6	+ 0.3	58.1	— 0.3	44.0	— 0.2	36.4	+ 5.5
El Paso	44.0	+ 1.0	49.6	+ 0.2	56.4	— 2.6	64.0	+ 2.3	73.2	— 2.7	82.4	+ 0.1	83.4	— 1.3	80.8	+ 0.2	73.4	— 0.4	63.8	+ 1.9	51.1	+ 1.9	45.6	+ 0.6
Galveston	52.3	— 2.1	57.8	+ 0.7	62.9	— 3.0	70.2	+ 1.3	76.1	— 1.2	82.2	— 1.8	84.0	— 1.0	83.5	— 0.9	79.6	— 1.4	73.0	+ 0.1	62.2	— 0.6	57.0	+ 0.4
Palestine	42.7	+ 1.1	52.6	0.0	58.7	— 4.9	66.4	+ 3.1	71.8	— 0.8	79.4	— 0.4	82.4	— 1.4	81.6	— 0.9	76.2	— 2.6	67.0	— 1.0	56.9	— 1.5	50.2	+ 1.4
Rio Grande City	56.6	— 0.8	63.4	+ 1.4	69.8	— 4.6	77.6	— 2.0	81.4	— 1.2	85.6	— 3.0	87.4	— 1.7	86.4	0.0	81.8	— 2.2	75.0	+ 1.3	65.0	— 0.9	59.8	+ 1.0
San Antonio (7)	50.0	— 1.6	56.6	+ 1.4	61.8	— 4.3	70.0	+ 0.6	75.4	— 1.6	81.8	— 2.6	83.6	— 1.2	82.8	0.0	77.6	— 2.4	69.4	+ 1.0	58.0	— 1.0	53.5	+ 2.1
Utah:																								
Salt Lake City	27.6	— 4.7	32.9	+ 5.4	41.2	— 1.2	49.6	+ 5.2	58.3	+ 0.3	68.2	+ 0.2	75.8	+ 0.8	74.6	+ 0.2	64.6	+ 6.0	51.4	+ 2.6	37.8	+ 3.8	34.0	+ 1.8
Virginia:																								
Cape Henry	39.7	+ 0.1	43.2	— 3.0	45.1	— 2.1	53.8	— 0.2	64.8	+ 0.5	72.5	+ 1.3	77.6	— 2.0	76.4	+ 2.4	72.4	— 1.2	63.0	— 5.2	52.1	+ 2.5	42.8	— 0.4
Lynchburgh	36.1	— 0.5	41.2	— 0.6	44.9	— 1.7	55.6	+ 0.5	66.6	— 2.0	73.8	+ 0.3	77.5	— 2.3	75.8	+ 1.0	69.6	— 5.0	58.8	— 4.8	47.0	+ 2.4	38.8	+ 1.2
Norfolk	39.8	— 1.0	44.6	— 1.7	46.7	— 1.1	55.3	+ 0.1	66.8	— 0.8	74.6	— 0.8	78.6	— 3.0	76.8	+ 1.6	72.2	— 2.0	62.4	— 5.3	51.6	+ 1.9	42.8	— 0.2
Washington:																								
Canby, Fort (5)	40.9	— 5.1	42.0	+ 1.6	46.0	— 1.8	49.2	+ 0.4	53.3	+ 0.5	56.4	+ 1.8	58.8	+ 1.1	59.4	+ 0.1	58.4	+ 1.4	53.4	+ 1.4	48.0	— 1.4	44.8	+ 2.2
Olympia	37.8	— 5.6	38.8	+ 4.0	44.6	— 0.8	48.8	+ 2.0	54.6	+ 2.4	59.2	+ 1.0	62.2	+ 0.1	62.4	+ 1.4	57.3	+ 3.3	50.4	+ 3.4	43.7	— 0.1	41.1	+ 1.5
Port Angeles (5)	34.8	— 3.3	36.8	+ 3.3	41.2	— 0.8	45.8	— 0.2	50.2	— 0.3	54.0	+ 1.1	56.8	+ 0.1	56.8	+ 1.0	53.0	+ 2.6	46.9	+ 2.3	41.9	— 1.0	37.9	+ 3.1
Spokane Falls	23.4	— 7.4	28.9	+10.3	40.8	— 2.2	48.6	+ 2.3	56.8	+ 1.9	63.3	— 1.9	68.8	— 0.6	68.1	+ 3.3	57.9	+ 6.7	46.5	+ 2.9	36.8	— 0.8	31.0	+ 2.5
Tatoosh Island (5)	40.2	— 4.3	40.8	+ 2.6	44.4	— 1.2	47.6	— 0.2	51.4	— 0.5	54.6	+ 1.0	57.2	— 0.4	57.0	— 0.2	54.8	+ 1.6	51.0	+ 1.7	46.9	+ 0.4	43.9	+ 3.9
Wisconsin:																								
La Crosse	12.4	—10.1	19.4	— 3.6	29.3	— 7.2	47.1	— 2.7	59.8	— 7.7	68.6	— 0.6	72.8	+ 0.9	69.9	— 2.1	61.6	— 3.8	50.0	— 3.4	34.6	+ 2.6	22.6	+ 5.4
Milwaukee	16.7	— 6.3	22.4	— 2.3	29.8	— 3.6	42.9	— 1.1	54.0	— 5.8	62.6	+ 1.6	69.0	— 0.8	67.8	— 0.9	61.4	— 3.2	50.4	— 2.8	36.2	+ 3.4	25.5	+ 4.7
Wyoming:																								
Cheyenne	23.6	— 1.0	27.2	+ 6.2	33.6	— 5.0	42.2	+ 5.6	51.6	— 3.1	62.8	0.0	67.9	+ 1.3	65.6	— 2.4	57.5	+ 1.1	45.4	+ 0.4	33.8	— 0.7	28.9	+ 5.1

APPENDIX 19.

Table of monthly and annual mean temperature for 1888, compiled from all available sources.

NOTE—Letters of the alphabet denote number of days missing from the record; thus "*c*" indicates that three days are missing.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Alabama;														
Auburn	47.2	52.1	54.2	67.1	71.0	76.0	80.0	78.4	72.1	62.2	54.7	46.1	63.4	Signal Service.
Bermuda	51.0	54.0	57.0	68.0	70.5	74.0	81.0	80.4	74.0	65.5	55.0	41.0	65.1	State weather service.
Carrollton	43.9	54.0	52.0	66.6	70.5	76.0	80.0	74.0	69.7	65.6	54.5	......	......	Do.
Citronelle	......	......	......	......	......	......	83.2	80.4	76.0	68.2	59.1	46.2	......	J. G. Michael.
Decatur	......	......	......	65.0	70.2	77.8	81.9	79.9	69.4	......	......	......	......	Signal Service.
Edwardsville	......	......	......	......	......	79.3	80.7	81.0	......	63.2	55.5	......	......	State weather service.
Eufaula	......	......	......	62.7	74.3	75.4	80.0	78.9	70.0	62.4	......	......	......	Signal Service.
Evergreen	......	......	......	69.4	73.1	80.8	81.6	76.6	72.7	65.6	......	......	......	Do.
Florence	40.1	48.0	48.7	65.2	69.6	72.0	81.0	79.3	67.3	58.3	50.7	44.5	60.4	State weather service.
Fort Deposit	......	......	......	68.5	72.4	79.5	80.0	76.9	75.7	62.4	......	......	......	Signal Service.
Gadsden	39.5	46.6	47.7	59.9	65.6	73.0	79.0	76.9	68.1	56.3	53.3	43.1	59.1	State weather service.
Greensborough	46.0	53.1	54.6	66.3	71.6	78.0	82.0	79.4	71.6	61.9	57.0	47.9	64.1	Do.
Greenville	50.4	54.5	54.0	67.5	70.9	80.0	......	......	......	......	......	......	......	Do.
Livingston (1)	......	......	......	^{d}67.4	72.1	78.9	82.4	80.6	73.0	62.8	......	......	......	Signal Service.
Livingston (2)	46.0	51.0	53.4	66.0	68.7	77.0	84.0	80.0	71.3	62.0	55.1	45.6	63.3	Prof. J. W. A. Wright.
Marion	......	......	......	66.2	72.5	80.9	82.8	79.7	73.2	62.7	......	......	......	Signal Service.
Mobile	52.4	56.3	57.5	68.0	72.1	77.5	82.4	80.0	75.8	67.5	59.4	51.0	66.7	Do.
Montgomery	51.1	54.5	56.6	68.7	72.4	78.6	82.7	80.8	73.8	64.1	56.6	48.0	65.7	Do.
Mount Vernon Barracks	52.7	57.1	60.1	70.2	71.5	79.3	83.1	79.9	75.0	66.5	58.5	49.8	67.0	U. S. post hospital.
Mount Willing	......	......	......	......	......	77.0	78.5	80.0	73.5	......	55.7	49.0	......	William M. Garrett.
New Market	39.3	45.4	48.7	63.5	62.8	71.3	78.9	76.0	66.9	59.5	50.8	41.7	58.7	Dr. George D. Norris.
Newton	55.3	58.6	59.2	71.9	74.3	......	......	......	......	......	......	......	......	State weather service.
Opelika	......	......	......	66.6	71.2	78.4	80.6	79.4	70.4	60.6	......	......	......	Signal Service.
Pine Apple	......	......	......	67.8	73.0	79.3	83.0	80.5	73.0	63.6	......	......	......	Do.
Scottsborough	......	......	......	^{a}64.7	69.2	76.6	80.6	79.6	^{a}69.6	^{c}58.6	......	......	......	Do.
Selma	......	......	......	......	......	78.8	82.1	80.8	72.3	63.2	......	......	......	Do.
Selma	44.0	......	......	......	72.6	78.2	84.4	82.4	......	62.5	......	47.8	......	State weather service.
Talladega	45.8	50.2	54.6	64.9	72.9	81.0	81.8	79.9	72.1	63.5	54.2	47.1	64.0	Do.
Troy	......	53.7	59.8	69.6	70.5	82.0	81.0	72.6	74.4	66.3	52.2	51.2	......	Do.
Tuscaloosa	49.8	54.9	58.8	70.3	73.2	80.1	83.4	71.5	74.2	60.1	58.6	51.0	65.5	Do.
Tuscumbia (1)	......	......	......	64.4	69.9	76.2	81.6	79.6	70.2	61.4	......	......	......	Signal Service.
Tuscumbia (2)	39.8	46.1	49.3	64.8	65.2	74.5	80.6	76.5	68.2	58.4	51.7	42.0	59.8	State weather service.
Union Springs	50.0	53.0	55.0	69.0	72.0	77.0	81.0	79.0	72.1	63.0	54.0	47.0	64.3	Do.
Uniontown	......	......	......	......	......	......	......	80.2	73.7	64.9	56.9	......	......	Do.
Valley Head	40.2	45.3	49.6	61.4	65.7	73.0	77.0	79.2	65.7	54.6	50.8	40.3	58.5	Do.

Arizona:													
Apache, Fort	34.6	41.6	42.8	56.6	59.8	69.4	77.0	....	*69.8	58.8	47.4	41.6	....	Signal Service.
Benson	44.6	49.7	56.2	67.7	73.4	84.6	84.1	84.3	78.8	69.9	54.9	49.6	66.5	Pacific Railway system.
Bowie, Fort	43.3	46.4	48.2	62.4	66.8	78.6	78.7	77.8	71.4	63.5	50.0	42.2	60.8	Signal Service.
Casa Grande	46.9	59.9	58.2	72.8	81.2	88.9	93.9	93.2	87.7	78.2	69.5	56.5	73.9	Pacific Railway system.
Grant, Fort	43.3	47.0	48.2	61.5	64.4	75.4	79.1	79.1	72.6	64.6	50.8	44.6	60.9	Signal Service.
Holbrook	27.5	41.2	42.8	57.8	61.8	72.0	77.5	74.8	72.7	60.6	46.9	38.0	56.1	David Rope.
Huachuca, Fort	44.8	47.6	49.0	63.1	67.2	77.6	76.5	75.8	72.4	65.9	50.7	44.8	60.9	U. S. post hospital.
McDowell, Fort	46.4	53.3	55.6	71.2	74.2	84.4	90.6	90.1	85.4	69.9	58.2	51.4	69.2	Signal Service.
McDowell, Fort	47.9	53.3	56.3	73.4	77.6	88.1	92,5	90.9	85.6	70.7	58.8	52.4	70.6	U. S. post hospital.
Maricopa	....	....	64.4	77.9	87.2	91.6	94.1	93.7	88.4	71.2	....	56.3	....	Pacific Railway system.
Mojave, Fort	46.4	57.0	60.7	73.5	75.6	84.3	90.1	84.7	88.2	72.5	57.2	49.4	70.0	U. S. post hospital.
Pantano	....	....	55.7	69.0	75.0	83.0	84.2	82.5	79,4	65.0	54.6	48.1	....	Pacific Railway system.
Phœnix	....	....	....	70.9	69.8	84.0	90.8	87.9	83.1	....	69.3	....	....	Signal Service.
San Carlos Agency	43.6	50.8	51.4	66.2	71.4	81.4	87.6	85.6	81.8	....	51.8	46.2	....	Do.
San Simon	51.5	57.0	54.7	66.8	79.7	80.5	....	....	80.6	69.0	56.5	51.8	....	Pacific Railway system.
Texas Hill	49.4	59.2	62.2	78.9	86.1	90.3	100.9	97.9	91.9	77.0	63.4	51.7	75.7	Pacific Railway system.
Thomas, Fort	44.6	49.6	54.0	66.5	69.0	81.0	87.4	84.7	79.7	64.8	53.6	46.4	65.1	Signal Service.
Tucson	62.7	70.4	69.9	68.0	78.5	92.6	95.6	94.0	89.2	75.0	64.3	62.1	76.9	Pacific Railway system.
Verde, Fort	37.6	48.8	49.7	63.4	66.4	75.2	83.4	85.2	76.6	64.0	50.5	44.2	62.1	Signal Service.
Whipple Barracks	27.5	40.5	41.0	55.3	58.6	68.4	74.2	70.1	67.6	55.9	43.8	37.9	53.4	Do.
Wilcox	43.1	47.4	46.0	61.6	64.5	73.8	78.5	76.3	71.5	61.6	44.8	44.0	59.3	Do.
Wilcox	44.8	50.7	54.3	66.8	70.4	79.9	....	82.1	77.1	67.3	60.3	51.6	....	Pacific Railway system
Yuma (1)	51.6	60.5	62.5	75.3	76.9	85.6	91.4	91.0	89.2	74.9	61.9	57.0	73.2	Signal Service.
Yuma (2)	52.0	....	63.3	76.5	78.4	90.7	95.4	....	90.3	78.4	....	55.3	....	Pacific Railway system.
Arkansas:														
Alexander	37.3	43.8	51.1	65.	68.7	76.0	82.5	80.2	69.3	56.0	46.6	41.1	59.8	State weather service.
Conway	30.3	39.0	42.6	61.0	62.9	72.3	82.7	79.0	63.9	57.5	49.1	44.0	57.0	Do.
Devall's Bluff	....	....	....	65.8	67.8	75.3	81.3	79.6	68.5	58.6	....	....	....	Signal Service.
Dallas	40.7	50.8	49.7	61.9	75.7	83.0	82.8	77.4	70.7	62.6	50.4	....	....	State weather service.
Dayton	....	....	....	....	72.7	77.8	82.1	81.9	71.1	60.6	50.6	44.9	....	Do.
Eureka Springs	32.9	41.9	45.1	63.1	65.0	73.3	....	....	....	....	....	47.2	....	Arthur H. Foote.
El Dorado	....	....	....	....	....	69.4	74.3	78.9	69.2	....	50.3	42.8	....	State weather service.
Fort Smith	34.9	44.5	47.8	65.0	67.7	76.0	82.0	80.0	71.4	59.9	48.8	43.8	60.2	Signal Service.
Forrest City	....	....	....	67.1	70.7	76.6	82.2	79.1	73.6	62.4	55.8	50.7	....	Do.
Helena	39.0	46.1	50.4	66.3	70.9	77.7	82.3	81.9	69.7	59.4	51.2	43.5	61.5	State weather service.
Hot Springs	39.0	44.2	48.8	65.3	68.7	75.3	....	74.1	....	....	....	....	....	U. S. post hospital.
Heber	39.3	43.7	47.6	64.8	65.7	74.6	80.9	77.4	67.8	56,7	47.0	41.1	58.9	State weather service.
Little Rock	38.6	45.9	49.7	66.2	69.1	75.5	81.9	80.0	71.2	58.8	49.9	44.3	60.9	Signal Service.
Lead Hill	31.9	41.1	46.2	65.3	66.9	77.1	84.2	79.2	68.9	56.9	45.2	39.6	58.5	Silas C. Turnbo.
Lonoke	....	....	....	68.0	70.0	76.0	83.0	80.3	73.4	61.5	52.3	47.6	....	State weather service.
Malvern	....	....	....	60.2	64.2	77.9	87.8	84.5	77.5	....	....	....	....	Do.
Monticello	....	....	....	....	68.5	78.4	82.4	81.9	73.1	64.3	....	....	....	Do.
Newport	....	....	....	62.8	69.9	77.3	84.1	80.0	....	57.7	....	....	....	Signal Service.
Osceola	35.0	43.0	47.3	64.3	68.1	74.0	82.4	78.4	68.1	57.8	....	....	....	State weather service.
Ozone	....	....	....	....	....	71.1	78.3	76.4	64.0	56.7	45.5	41.0	....	Do.
Pine Bluff	....	....	....	67.9	71.4	78.9	83.5	81.4	....	....	....	....	....	Signal Service.
Prescott	....	....	....	66.2	70.2	76.8	[1]87.2	81.2	73.1	[h]61.3	54.4	....	....	Do.
Portia	33.2	40.2	47.9	65.5	70.6	77.8	83.8	78.8	68.6	57.1	47.5	41.6	59.4	State weather service.
Russellville	....	....	51.0	66.3	69.5	77.3	82.7	....	70.2	57.8	....	....	....	Signal Service.
Stuttgart	....	....	....	....	69.6	76.2	81.3	78.3	68.5	57.8	49.5	42.5	....	State weather service.

Table of monthly and annual mean temperature for 1888, *etc.*—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Arkansas—Continued.														
Texarkana	......	......	......	63.1	70.1	78.6	83.4	83.3	74.1	64.0	53.5	47.7	......	Signal Service.
Washington	39.6	47.2	50.9	67.0	70.9	77.5	80.9	80.2	71.1	60.9	51.4	45.3	61.9	State weather service.
California:														
Alcade	......	......	......	......	......	......	85.0	86.4	83.3	68.2	56.1	49.1	......	Pacific Railway system.
Alcatraz Island	45.2	51.5	51.3	54.6	54.3	60.2	58.4	56.2	......	59.3	55.5	51.8	......	U. S. post hospital.
Almaden	46.6	54.2	54.5	61.2	62.3	68.6	70.6	72.5	69.4	64.2	56.6	54.7	61.3	Pacific Railway system.
Anaheim	55.6	58.5	59.5	66.9	67.9	73.5	71.3	72.1	74.8	69.3	63.4	60.9	66.1	Do.
Anderson	......	......	......	......	......	......	......	83.5	84.0	63.0	55.5	51.8	......	Dr. A. Fouch.
Angel Island	46.4	......	......	59.1	54.8	64.4	63.4	......	......	......	......	......	......	U. S. post hospital.
Antioch	44.6	52.6	54.0	60.0	65.9	67.9	76.2	78.2	80.1	67.9	51.9	47.6	62.2	Pacific Railway system.
Aptos	46.0	51.9	53.0	58.4	59.7	67.9	65.9	63.2	61.8	59.1	53.9	54.1	57.9	Do.
Athlone	43.4	52.2	54.8	67.6	71.9	76.4	81.7	84.5	79.1	66.1	55.0	50.2	65.2	Do.
Auburn	40.4	50.9	51.3	61.4	61.0	66.9	76.5	79.5	76.9	64.2	52.9	47.1	60.8	Do.
Banning	......	55.0	......	......	......	......	......	......	......	71.4	59.3	51.0	......	Welwood Murray.
Barstow	......	......	......	......	......	......	80.8	......	......	67.0	54.6	47.2	......	George R. Gooding,
Beaumont	41.5	51.3	48.2	62.0	62.7	69.9	77.4	79.7	78.5	65.8	55.9	53.7	62.2	Pacific Railway system.
Berkeley	45.0	51.3	50.2	55.7	55.5	62.1	61.7	60.0	61.0	59.1	55.1	51.8	55.7	Prof. Fred. Soulé.
Benicia Barracks	43.3	......	......	60.4	59.4	67.0	69.2	71.6	......	64.9	55.8	48.8	......	U. S. post hospital.
Bidwell, Fort	21.8	36.6	36.6	51.6	53.8	55.6	66.4	68.3	65.6	52.0	39.4	37.2	48.7	Signal Service, U. S. post hosp'l.
Bishop Creek	33.4	50.9	56.3	69.6	78.1	86.0	87.7	91.7	81.7	65.3	48.9	38.8	65.7	Pacific Railway system.
Boca	15.8	27.6	33.4	42.5	53.4	58.4	67.9	63.6	60.4	43.5	33.5	31.2	44.3	Do.
Borden	43.8	51.7	54.7	69.5	70.5	75.4	82.5	86.8	......	......	......	48.9	......	Do.
Brentwood	42.2	51.3	57.8	67.6	75.6	77.8	84.7	83.1	77.1	71.1	49.8	49.9	65.7	Do.
Brighton	45.4	54.5	55.3	66.9	69.1	74.6	79.8	81.8	81.7	71.3	59.1	49.6	65.8	Do.
Byron	41.8	56.5	59.4	69.2	69.5	78.2	80.3	84.5	79.0	69.1	57.9	53.2	66.6	Do.
Caliente	47.0	55.4	53.3	67.9	74.1	75.1	83.5	82.1	82.9	69.6	56.5	52.9	66.5	Do.
Calistoga	44.4	53.7	55.1	60.3	58.5	64.8	67.3	68.7	65.8	61.7	54.7	52.7	59.0	Do.
Centreville	48.6	55.0	55.6	62.0	63.0	69.0	68.0	72.5	80.2	65.8	58.3	55.0	62.8	William Barry.
Chico	42.6	54.9	56.4	70.9	71.6	75.1	86.0	86.2	83.0	67.2	54.7	51.4	66.7	Pacific Railway system.
Cisco	27.8	33.0	34.8	44.8	48.2	51.1	63.4	62.3	62.6	50.2	39.7	35.7	46.1	Do.
Coles	40.8	40.6	39.9	51.6	53.0	58.0	69.2	70.9	64.6	53.6	42.4	40.0	52.0	Do.
Colfax	37.8	47.8	49.0	60.4	61.2	65.4	75.0	76.8	73.7	60.9	50.7	47.6	58.9	Do.
Colton	47.7	55.6	62.0	65.0	69.0	73.2	80.4	78.0	79.3	70.4	65.7	57.2	67.0	Do.
Corning	39.9	49.0	50.1	69.5	71.4	72.6	85.6	78.6	81.6	75.1	57.5	49.3	65.0	Do.
Davisville	43.4	50.7	53.1	65.1	66.8	69.9	77.1	76.9	71.4	65.3	57.0	53.7	62.5	Do.
Delano	44.2	49.0	50.2	66.6	70.9	76.3	85.6	87.3	84.8	73.2	59.0	51.9	66.6	Do.
Delta	33.7	45.8	44.4	62.3	66.4	67.4	77.2	76.4	74.6	61.2	54.2	48.7	59.4	Do.
Downey	47.8	51.1	54.3	61.9	62.0	70.8	66.5	65.8	71.4	62.5	55.8	52.8	60.2	V. M. Hardy.
Dunnigan	45.0	57.2	61.8	71.5	73.1	79.0	82.7	83.3	80.5	71.5	55.5	52.6	67.8	Pacific Railway system.

Dunsmuir	....	....	[c]43.8	53.9	51.0	52.8	59.2	58.7	61.1	62.6	53.5	44.7	....	Do.
Elmira	44.6	54.4	56.6	64.4	65.4	73.1	78.1	82.5	80.6	65.8	59.0	53.0	64.8	Do.
Elsinore	47.0	53.0	50.0	59.9	[c]63.6	68.4	75.3	[a]74.8	[d]73.9	64.6	53.9	50.8	61.3	G. W. Varnum.
El Verano	....	....	....	....	....	....	....	70.7	67.7	62.1	55.6	53.0	....	Pacific Railway system.
Emigrant Gap	32.3	39.2	38.7	53.9	53.0	54.7	64.7	67.3	66.7	54.9	43.6	40.4	50.8	Do.
Eureka	44.6	48.1	47.1	50.9	53.0	58.8	58.0	57.4	57.4	54.6	51.2	52.2	52.8	Signal Service.
Farmington	44.5	53.1	54.5	66.3	66.5	72.8	76.3	81.6	78.4	65.4	54.2	48.8	63.5	Pacific Railway system.
Fresno (1)	44.1	53.2	54.1	67.1	68.6	74.1	81.7	83.0	80.7	66.5	54.3	48.2	64.6	Signal Service.
Fresno (2)	47.9	....	54.7	68.0	67.7	82.3	81.5	85.7	82.4	69.7	59.2	54.3	....	Pacific Railway system.
Galt	46.8	47.5	53.1	68.2	68.7	72.7	80.1	78.6	73.8	65.8	56.0	49.6	63.4	Do.
Gaston, Fort	36.2	43.9	49.0	....	57.1	58.1	69.9	68.3	....	56.1	47.9	42.6	....	U. S. post hospital.
Georgetown	38.0	48.1	46.8	46.2	58.3	63.3	....	77.7	....	62.2	51.8	46.9	....	C. M. Fitzgerald.
Gilroy	44.8	51.1	52.3	62.0	61.8	71.9	71.4	74.1	70.8	61.7	55.4	51.4	60.7	Pacific Railway system.
Goshen	44.6	54.1	52.3	70.9	74.6	80.7	88.8	90.3	85.8	70.7	58.8	49.0	68.4	Do.
Hollister	47.6	54.3	54.9	60.9	61.3	67.9	68.4	68.4	63.7	59.0	53.9	53.5	59.5	Do.
Hornbrook	22.0	41.3	47.0	58.5	63.9	66.0	70.9	77.4	73.1	57.6	43.2	41.6	55.2	Do.
Indio	47.8	60.3	62.3	75.6	74.2	89.7	96.9	95.4	93.6	79.8	65.0	55.7	74.7	Do.
Ione	42.6	50.6	50.5	61.3	65.4	75.1	80.6	82.3	78.5	67.1	59.9	58.2	64.3	Do.
Iowa Hill	....	49.1	48.5	60.9	61.1	63.9	75.6	78.4	77.2	64.6	52.5	....	....	C. F. Macy.
Keeler (1)	35.1	47.3	50.0	63.9	66.0	74.0	81.7	82.8	80.2	67.9	51.1	43.7	62.0	Pacific Railway system.
Keeler (2)	35.3	47.8	50.6	63.4	66.4	73.9	80.2	80.7	78.3	65.2	49.8	42.8	61.2	Signal Service.
Keene	41.1	47.5	50.5	60.7	63.5	68.5	75.5	77.0	76.3	61.7	50.8	48.9	60.2	Pacific Railway system.
King City	44.2	48.2	47.1	55.3	63.9	68.7	70.1	68.1	68.1	61.8	55.1	52.3	58.6	Do.
Kingsburg	41.3	48.5	52.7	70.2	67.9	74.7	84.4	86.2	82.1	68.0	55.2	48.8	65.0	Do.
Knight's Landing	41.3	50.5	51.0	60.3	66.3	67.2	74.3	73.6	74.0	64.5	53.6	48.8	60.4	Do.
La Grange	43.9	50.0	55.1	66.1	66.4	72.3	77.1	82.8	66.5	68.8	54.6	49.8	62.8	Joseph Dominica.
Lathrop	44.9	52.6	53.3	64.3	65.7	72.6	75.4	75.3	71.1	61.8	54.7	47.8	61.6	Pacific Railway system.
Lemoore	43.8	50.6	53.6	66.8	65.2	74.6	82.8	83.4	82.8	66.0	52.7	46.9	64.1	Do.
Lewis Creek	46.4	55.0	56.1	74.0	75.0	82.0	83.0	85.0	86.0	71.0	58.0	50.0	68.5	John Tuohy.
Linden	43.5	50.5	[b]52.0	[a]61.0	[b]62.0	[c]66.0	....	....	....	....	....	....	....	J. Green.
Livermore	46.9	53.7	53.7	59.9	58.8	64.0	63.6	66.0	64.6	59.5	51.9	47.6	57.5	Pacific Railway system.
Livingston	48.2	56.4	57.8	68.3	70.6	74.9	86.3	82.9	79.6	67.4	55.9	49.2	66.5	Do.
Los Angeles (1)	50.0	54.4	55.1	61.9	60.8	67.5	73.4	73.0	73.8	66.0	59.9	57.4	62.9	Signal Service.
Los Angeles (2)	49.8	54.2	57.0	64.1	64.7	69.6	73.9	73.1	72.8	65.9	59.2	55.6	63.3	Pacific Railway system.
Los Banos	44.6	54.3	55.7	67.8	68.6	75.8	80.2	84.4	80,5	68.4	54.8	49.6	65.4	Adolph Widmann.
Los Gatos	55.4	52.0	51.0	58.4	59.2	65.6	67.8	70.0	[a]68.8	....	[b]56.3	52.4	....	D. Vandenburg.
Mammoth Tank	49.6	59.4	63.0	82.0	82.6	93.4	97.2	96.0	93.9	78.6	61.3	52.0	75.8	Pacific Railway system.
Martinez	44.0	53.1	49.7	58.9	58.6	70.7	74.3	68.3	67.8	63.5	54.2	50.8	59.5	Do.
Marysville	54.5	57.5	63.9	70.4	70.2	78.8	81.3	81.4	77.6	67.4	52.7	47.7	67.0	Do.
Mason, Fort	47.6	....	....	59.9	56.3	62.0	61.3	59.3	60.0	59.2	55.4	52.6	....	U. S. post hospital.
Menlo Park	45.8	52.5	51.4	59.0	60.4	67.0	70.2	69.5	66.7	61.7	55.2	53.1	59.4	Pacific Railway system.
Merced	47.1	54.6	54.2	65.9	69.3	76.3	83.4	83.0	77.7	68.5	58.2	50.8	65.8	Do.
Modesto	44.2	50.8	54.4	66.2	66.1	73.4	80.9	86.6	80.7	64.7	52.7	50.4	64.3	Do.
Mojave	43.7	52.1	53.7	71.0	67.6	73.1	81.2	85.3	93.9	69.4	58.4	51.8	66.8	Do.
Montague	....	49.8	49.9	61.9	65.4	65.6	80.3	85.9	74.3	61.9	44.1	40.4	....	Do.
Monterey	49.7	54.8	54.6	61.9	60.0	64.8	64.6	63.1	62.5	59.5	57.3	55.2	59.0	Do.
Mount Hamilton	....	....	....	....	....	....	66.0	71.7	69.1	56.9	46.5	31.0	....	Lick Observatory.
Napa	44.6	49.5	51.8	56.4	60.7	69.8	69.3	....	65.8	60.4	52.7	51.0	....	Pacific Railway system.
Newark	....	....	....	....	....	....	....	68.6	68.4	65.0	58.1	49.8	....	Do.
Newhall	45.5	50.9	54.9	65.1	64.0	71.5	77.6	75.2	76.6	63.9	52.9	49.8	62.3	Do.
Nicolaus	43.2	52.3	56.5	....	64.7	68.9	....	....	....	65.6	53.1	49.9	....	Alvah Pendleton.
Niles	....	50.5	54.8	61.7	63.9	66.3	73.8	68.4	66.7	63.0	62.5	55.2	....	Pacific Railway system.

Table of monthly and annual mean temperature for 1888, *etc.*—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
California—Continued.														
Nordhoff	44.4	50.8	53.8	60.8	59.2	......	......	......	......	63.7	54.0	51.2	......	R. Robinson.
Oakland (1)	45.4	52.3	52.2	57.3	57.0	63.1	62.2	61.6	62.0	60.2	55.7	52.3	56.8	Dr. J. B. Trembley.
Oakland (2)	47.4	52.6	51.0	57.6	57.0	62.9	62.5	61.4	60.8	59.1	54.2	52.1	56.6	Pacific Railway system.
Orland	44.5	54.8	53.9	69.0	70.7	75.3	85.1	85.5	84.3	74.8	57.5	51.1	67.2	Do.
Oroville	45.4	55.2	56.0	66.0	69.0	72.0	79.1	81.0	80.0	68.0	56.4	50.6	64.9	Hiram Arents.
Pajaro	47.1	53.1	52.1	56.0	58.3	63.1	63.5	61.4	62.3	60.8	55.6	55.8	57.4	Pacific Railway system.
Paso Robles	41.1	47.8	51.9	62.3	64.0	71.7	73.5	74.4	71.0	60.4	51.3	47.9	59.8	Do.
Petaluma	44.2	50.8	49.0	57.3	57.8	61.2	68.2	67.3	65.0	65.0	55.1	51.3	57.7	Do.
Placerville	......	......	......	......	......	......	74.5	73.2	71.9	57.9	49.9	46.8	......	Do.
Pleasanton	48.1	53.7	54.9	61.8	63.4	69.8	74.7	75.7	75.7	67.8	51.3	51.6	62.4	Do.
Presidio of San Francisco	45.7	51.7	51.2	55.3	55.1	60.8	59.5	......	......	59.8	55.3	54.2	......	U. S. post hospital.
Red Bluff (1)	41.6	56.1	52.9	67.4	70.5	72.5	84.9	88.0	84.2	70.0	56.5	50.5	66.3	Pacific Railway system.
Red Bluff (2)	40.9	53.9	54.5	67.0	68.1	70.7	81.2	82.4	80.2	67.0	54.0	48.0	64.0	Signal Service.
Redding	39.2	52.4	55.3	69.6	74.2	72.5	83.0	80.9	81.5	66.4	48.5	53.9	64.8	Pacific Railway system.
Riverside (1)	48.4	51.2	53.1	62.4	62.5	70.2	76.3	75.3	74.4	64.1	56.0	51.8	62.1	W. E. Keith.
Riverside (2)	47.4	52.6	53.4	69.9	63.6	......	......	......	......	66.9	59.9	......	......	A. K. Holt.
Rocklin	42.7	49.8	52.5	59.7	64.0	70.2	79.9	82.1	78.4	66.8	55.0	48.5	62.5	Pacific Railway system.
Rumsey	......	......	......	......	......	......	84.1	84.6	82.4	70.9	56.2	50.8	......	Do.
Sacramento (1)	42.8	52.6	53.6	62.3	61.8	67.7	73.4	76.8	75.4	65.2	54.0	48.4	61.2	Signal Service.
Sacramento (2)	39.4	47.9	50.7	59.5	61.8	66.8	70.2	74.4	68.6	57.6	48.8	46.2	57.7	S. H. Gerrish.
Sacramento (3)	42.1	51.0	52.6	62.2	64.0	......	73.3	74.5	72.2	61.6	52.6	48.7	......	Pacific Railway system.
Salinas (1)	44.1	49.7	48.6	56.2	58.1	68.4	66.2	60.3	59.3	57.3	50.8	52.2	55.9	Do.
Salinas (2)	44.9	50.3	50.2	54.2	57.0	62.1	61.4	59.5	59.6	55.7	52.4	51.4	54.9	Dr. E. K. Abbott.
San Ardo	44.6	50.8	52.0	60.0	62.7	70.1	69.4	69.9	70.5	62.0	54.9	51.9	59.9	Pacific Railway system.
San Diego	51.6	54.9	55.8	60.8	61.2	66.0	68.4	69.2	69.7	65.0	59.9	58.2	61.7	Signal Service.
San Fernando	44.6	52.4	55.6	69.5	62.1	75.1	76.4	74.9	76.7	68.2	58.2	55.1	64.1	Pacific Railway system.
San Francisco	46.3	52.8	52.5	56.2	55.4	61.0	61.4	60.8	62.6	61.6	57.0	53.2	56.7	Signal Service.
Sanger Junction	......	......	......	......	......	......	......	89.2	84.1	72.5	59.6	51.2	......	Pacific Railway system.
San José	46.4	52.6	52.8	58.3	59.8	65.2	66.8	68.6	68.0	62.3	56.5	52.9	59.2	Do.
San Luis Obispo	46.3	51.9	51.7	57.2	57.0	62.0	62.6	63.1	62.3	62.0	56.6	55.8	57.4	J. E. Lewis.
San Mateo	46.5	51.2	51.7	58.3	58.2	67.1	69.7	66.7	62.8	58.1	49.3	50.6	57.5	Pacific Railway system.
San Miguel	43.2	52.5	54.5	61.2	62.2	69.5	69.9	73.2	70.7	62.5	54.4	50.9	60.4	Do.
San Pedro	......	......	......	......	......	......	76.2	77.3	75.0	69.2	62.1	59.1	......	Do.
Santa Barbara (1)	48.4	56.1	54.8	62.6	62.8	70.7	72.5	69.0	67.0	65.0	59.6	55.8	62.0	Do.
Santa Barbara (2)	49.0	53.8	53.0	59.9	62.8	64.4	67.0	66.3	67.9	63.5	59.1	55.8	60.2	H. D. Vail.
Santa Clara	47.8	54.6	52.3	57.9	57.8	64.1	65.2	67.2	68.7	62.1	56.6	53.3	59.0	A. Block.
Santa Cruz	49.2	53.1	54.8	59.3	59.3	67.5	66.4	64.4	65.8	66.3	58.0	57.1	60.1	Pacific Railway system.
Santa Maria	......	53.0	......	61.0	61.6	65.7	66.0	65.0	65.0	......	56.6	......	......	L. E. Blochman.
Santa Monica	56.8	58.0	57.2	65.3	64.0	68.0	76.7	74.6	72.6	67.8	60.5	55.8	64.8	Pacific Railway system.
Santa Rosa	......	......	......	......	......	......	......	71.7	67.4	62.1	53.9	51.5	......	Do.

Selma	43.6	50.4	51.7	68.1	70.7	77.2	85.8	87.7	83.4	62.1	57.0	48.0	65.1	Do.
Sims	......	......	53.7	66.1	72.4	71.7	83.5	88.4	79.1	69.8	53.9	41.0	......	Do.
Sisson	......	......	43.4	60.3	45.4	57.1	66.1	69.2	63.1	53.4	44.6	41.0	......	Do.
Soledad	42.1	50.4	50.5	59.2	57.6	63.6	64.8	63.7	63.2	58.1	51.1	49.1	56.1	Do.
Sonoma	[d]43.5	[b]53.6	53.6	......	......	[d]67.0	......	......	[e]67.6	63.8	[d]57.5	......	......	Robert Hall.
Soquel	50.3	52.2	53.6	59.6	61.0	68.4	69.5	63.7	61.5	61.3	51.5	55.0	59.0	Pacific Railway system.
South Side	46.0	52.3	51.5	63.5	61.5	70.0	77.2	78.2	80.1	65.2	56.0	52.1	62.8	Do.
South Vallejo	44.4	......	53.4	57.0	57.8	63.7	66.6	68.6	66.9	63.2	56.0	50.2	......	Do.
Spadra	49.1	52.2	51.0	61.8	62.7	69.8	68.4	67.7	67.7	61.3	56.6	53.1	60.1	Do.
Steeles	45.8	52.0	52.6	58.8	58.6	64.6	65.4	[a]65.1	65.0	63.6	57.1	54.0	58.6	A. T. Mason.
Stockton	44.3	51.1	53.6	62.3	62.0	68.1	71.1	74.9	72.3	62.2	53.3	49.6	60.4	Pacific Railway system.
Suisun	44.7	51.9	56.9	63.5	61.7	68.3	71.1	72.5	71.9	65.7	58.7	54.1	61.8	Do.
Summit	22.4	30.9	30.5	40.7	45.9	50.1	60.0	59.6	59.7	48.7	35.5	31.7	43.0	Do.
Sumner	46.5	54.9	57.7	73.5	75.7	83.2	91.7	89.4	86.5	68.4	......	......	......	Do.
Tehachapi	32.9	41.3	46.2	54.7	61.4	......	......	......	68.4	49.7	42.7	39.0	......	Do.
Tehama	41.1	54.6	54.7	66.1	65.4	68.6	78.8	81.1	72.7	64.5	57.9	55.0	63.4	Do.
Templeton	46.0	54.0	54.4	61.8	61.2	69.8	71.2	73.7	70.4	60.3	52.6	50.3	60.5	Do,
Towles	34.5	46.4	49.3	53.9	60.9	55.0	69.0	60.8	62.6	54.1	51.3	43.2	53.4	Do..
Tracy	47.6	51.4	52.5	65.4	68.3	72.6	75.4	78.9	73.2	64.5	57.3	50.2	63.1	Do.
Traver	......	......	54.8	65.2	76.4	83.0	89.0	85.5	81.4	69.0	57.4	43.2	......	Do.
Tropico	48.3	52.7	55.7	64.3	65.7	71.8	74.0	72.5	74.5	63.7	55.3	53.1	62.6	Do.
Truckee	20.2	29.6	33.6	46.5	51.6	56.0	67.3	64.9	61.6	50.6	40.0	34.0	46.3	Do.
Tulare	44.0	51.5	57.0	73.0	75.0	80.5	86.4	85.0	81.1	71.6	61.7	50.2	68.1	Do.
Turlock	44.0	53.2	55.9	64.6	67.0	74.1	78.2	81.6	76.5	65.2	54.6	53.1	64.0	Do.
Upper Mattole	42.3	52.0	47.9	57.2	57.1	60.3	62.5	64.3	64.1	......	......	......	......	W. N. Roscoe.
Vacaville	43.1	......	54.3	63.0	63.4	69.2	73.9	79.5	76.3	68.7	56.0	49.3	......	G. O. Coburn.
Walla Walla Creek	......	40.6	41.2	53.5	57.7	56.6	67.2	69.4	66.1	54.2	42.9	40.2	......	I. Titcomb.
Walnut Creek	44.7	51.7	54.4	[g]61.2	[a]61.3	[a]69.0	72.3	74.9	74.7	68.3	60.7	54.1	62.3	A. L. Bancroft.
Westport	46.0	48.5	49.6	54.6	54.8	65.0	61.2	58.6	58.1	56.5	......	......	......	E. S. S. Root, M. D.
Wheatland	43.0	52.4	53.8	63.9	64.8	69.2	75.8	78.8	77.2	66.2	53.4	48.1	62.2	W. M. Lumbard.
Williams	46.1	53.4	52.6	64.1	68.9	79.0	87.7	82.9	84.8	74.3	55.1	47.9	66.4	Pacific Railway system.
Willows (1)	41.8	51.7	53.1	64.6	67.9	71.4	80.1	81.1	79.2	63.1	54.7	49.8	63.2	David Bentley.
Willows (2)	40.3	51.1	51.6	64.1	67.2	70.9	79.8	78.8	84.2	67.8	52.5	47.6	63.0	Pacific Railway system.
Winters	......	......	......	......	......	......	......	84.5	82.4	72.4	60.5	51.3	......	Do.
Woodland	43.2	46.1	48.1	51.7	62.5	67.3	73.4	76.1	74.6	68.8	58.3	50.1	60.0	Do.
Colorado:														
Akron	......	......	[g]33.2	[j]56.2	......	[a]70.8	[c]76.3	......	[f]53.8	......	......	......	......	State weather service.
Alma	......	19.9	[a]20.7	34.8	37.5	49.8	[a]54.3	49.4	46.1	34.5	23.4	19.9	......	Do.
Aspen	19.5	27.8	......	42.0	43.5	54.0	60.0	......	[a]54.3	39.3	26.7	20.4	......	Do.
Bennett	......	40.2	38.0	57.2	56.6	82.4	92.4	......	......	......	......	......	......	I. S. Putnam.
Cañon City	32.4	41.2	40.5	56.3	60.2	76.2	75.4	69.0	66.1	52.1	39.2	39.8	54.0	State weather service.
Climax	9.7	15.8	15.0	29.5	30.9	45.0	53.4	47.3	45.6	30.4	19.5	15.3	29.8	Do.
Collins, Fort	20.8	36.7	34.3	54.6	53.3	......	......	......	60.2	48.5	32.1	30.4	......	Prof. L. G. Carpenter.
Colorado Springs	26.9	36.1	35.2	51.5	52.4	67.2	71.8	65.4	60.6	49.0	36.4	34.6	48.9	Signal Service.
Como (near)	19.5	22.4	23.3	37.9	38.9	52.4	57.2	51.7	49.7	36.1	26.0	23.2	36.5	State weather service.
Delta	......	......	......	......	......	......	......	......	62.5	47.4	33.4	24.7	......	J. A. Curtis.
Denver	27.3	38.6	33.4	53.2	53.2	68.4	74.2	68.0	62.8	51.0	37.0	37.2	50.4	Signal Service.
Forest Glen	21.3	30.4	[c]29.3	[d]46.0	......	......	......	......	......	......	......	......	......	State weather service.
Georgetown (1)	......	......	......	43.7	45.1	57.7	62.5	57.1	55.1	42.7	32.7	31.2	......	W. A. Jayne, M. D.
Georgetown (2)	25.5	29.7	30.2	43.9	44.9	57.8	62.4	56.9	56.8	42.6	32.4	31.9	42.9	State weather service.
Glenwood Springs	......	......	......	52.4	55.0	......	[a]73.3	69.0	65.8	49.2	36.3	29.7	......	Do.
Grand Junction	18.9	36.6	39.3	54.9	64.1	......	......	......	......	......	......	......	......	Do.

Table of monthly and annual mean temperature for 1888, *etc.*—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Colorado—Continued.														
Greeley	18.3	37.2	33.1	....	....	....	72.3	65.8	56.8	d48.8	a33.7	30.7	....	E. Bethel.
Gunnison	....	....	....	....	....	....	....	56.2	53.7	41.1	25.6	16.5	....	State weather service.
Home	....	29.5	28.3	44.2	f37.2	a58.6	65.6	59.2	....	....	....	....	....	Do.
Husted	23.1	35.4	32.6	48.2	52.4	62.5	70.4	65.0	60.0	48.0	39.0	33.0	47.5	Do.
Idaho Springs	....	....	....	....	c48.7	c55.0	d64.0	b58.1	c54.6	h42.5	30.9	g31.3	....	Do.
Julesburg	....	....	....	....	53.8	d69.6	c75.1	69.0	64.1	a47.8	....	....	....	Do.
Las Animas	24.6	37.9	37.6	56.7	59.5	....	....	....	....	....	....	....	....	Signal Service.
Leadville	....	....	....	....	....	51.8	56.1	51.0	48.2	35.6	25.3	20.4	....	State weather service.
Lewis, Fort	20.1	29.3	28.9	45.6	48.8	59.7	66.3	62.0	60.6	46.6	33.4	26.6	44.0	U. S. post hospital.
Longmont	19.1	b30.5	31.3	53.8	b53.2	b68..3	b72.1	b66.3	f59.7	f49.4	....	....	....	State weather service.
Lyon, Fort	....	....	....	....	....	....	....	....	g66.4	52.9	37.8	34.9	....	U. S. post hospital.
Minneapolis	19.1	32.4	33.7	50.8	56.2	72.1	75.8	....	....	....	....	....	....	State weather service.
Monte Vista	15.1	26.9	30.2	45.6	....	61.4	65.6	62.3	57.0	42.6	30.2	16.8	....	Do.
Montrose	21.7	34.9	37.3	53.0	55.1	67.8	72.8	66.8	65.0	50.0	36.9	28.6	49.2	Signal Service.
Morgan, Fort	10.4	31.9	28.8	50.6	....	....	....	....	....	....	....	....	....	State weather service.
Ouray	....	....	....	....	....	59.9	64.2	58.8	57.1	42.9	31.4	26.1	....	Do.
Pandora	19.6	30.4	31.3	42.9	43.0	52.2	a61.7	....	....	....	....	....	....	Do.
Paoli	....	....	....	....	....	....	....	g70.9	....	46.9	32.8	29.6	....	Do.
Pike's Peak	4.8	7.0	8.2	20.8	21.3	35.1	43.6	37.6	35.4	....	....	....	....	Signal Service.
Pueblo (1)	....	....	....	....	....	....	77.2	71.1	65.6	52.6	37.9	36.7	....	Do.
Pueblo (2)	....	....	37.2	56.5	58.6	73.9	74.8	69.4	63.3	50.6	34.7	32.6	....	State weather service.
Red Cliff	....	a18.2	20.2	37.7	a40.3	b49.7	....	....	....	....	....	....	....	Do.
Rocky Ford	....	....	....	....	....	....	....	....	....	56.4	38.5	34.3	....	F. Watrous.
Saguache	16.5	28.4	30.5	46.4	50.2	61.8	65.4	61.2	57.3	44.1	31.0	22.7	43.0	State weather service.
Thon	....	....	e33.8	49.9	49.8	66.6	70.8	64.2	46.2	45.4	31.9	....	....	Do.
Trinidad	32.4	36.2	36.7	54.6	60.6	....	....	....	....	....	....	....	....	Do.
T. S. Ranche	22.6	36.2	37.8	54.6	58.2	71.8	75.8	69.3	66.5	50.8	38.2	28.6	50.9	Do.
Walden	16.5	25.4	c24.6	42.6	45.0	57.7	63.5	57.4	54.5	41.8	....	....	....	Do.
Connecticut:														
Canton	11.0	18.0	20.0	33.0	45.0	56.0	56.0	59.0	50.0	38.0	34.0	27.0	37.2	New England Met. Society.
Colchester	19.0	28.3	29.2	43.0	55.4	....	....	69.5	59.5	46.8	42.1	31.6	....	Do.
Hartford	13.5	22.8	24.5	43.6	58.4	71.5	70.4	70.5	57.5	42.2	37.6	31.0	45.2	William R. Matson.
Mansfield	....	....	....	....	....	65.3	66.4	67.3	57.1	43.8	39.7	30.0	....	New England Met. Society.
Middletown	17.3	25.0	28.6	43.1	55.4	67.7	67.6	68.5	58.5	45.5	41.2	31.7	45.8	Do.
New Hartford	11.7	18.8	23.2	37.3	52.9	65.6	67.8	67.6	56.2	40.3	35.7	25.7	41.9	Rev. William Goodwin.
New Haven	20.5	27.8	29.4	44.0	55.0	67.8	68.8	70.4	61.1	47.6	43.0	32.8	47.4	Signal Service.
New London	28.3	30.2	32.3	44.6	55.4	67.2	68.4	70.4	60.9	49.3	44.8	35.2	48.5	Do.
Shelton	18.3	25.4	27.6	42.2	55.1	67.2	67.8	68.4	59.0	44.6	40.5	30.0	45.5	New England Met. Society.
Southington	17.0	25.4	29.2	43.7	57.2	69.0	69.2	69.8	59.0	45.3	40.3	30.8	46.3	Luman Andrews.
Thompson	16.1	25.4	27.9	41.4	52.0	65.2	67.6	67.8	57.6	43.8	38.9	29.2	44.4	New England Met. Society.

Voluntown	21.3	28.8	30.4	44.0	....	[b]69.0	[f]70.3	70.6	58.6	46.1	43.4	32.8	....	Rev. E. Dewhurst.
Waterbury	16.6	23.5	27.7	42.1	54.6	67.4	66.4	68.9	59.2	44.1	40.1	30.7	45.1	New England Met. Society.
Dakota:														
Abraham Lincoln, Fort	−5.5	10.0	13.4	43.4	51.2	64.8	70.7	....	58.4	42.8	27.8	24.6	....	U. S. post hospital.
Bismarck	−5.3	10.7	13.4	42.2	49.2	63.3	69.7	64.6	59.0	43.4	29.4	23.2	38.6	Signal Service.
Brookings	....	....	....	....	....	....	70.4	62.2	56.8	42.9	30.5	24.0	....	Dakota Agricultural College.
Buford, Fort	−5.6	11.8	13.1	41.3	50.2	63.2	69.1	64.0	59.4	48.8	27.6	22.0	38.3	Signal Service.
Davenport	....	....	....	44.4	49.7	65.6	69.9	64.4	....	40.0	28.0	20.3	....	J. W. Leech.
Gallatin	....	17.5	....	36.3	41.0	....	67.0	....	56.2	43.8	26.0	18.8	....	S. J. Pound.
Garden City	−3.3	10.8	16.0	40.0	47.2	64.8	70.4	63.6	56.1	41.2	29.0	21.6	38.1	W. C. T. Newell.
Huron	−1.4	14.0	19.2	44.8	50.4	66.1	73.5	67.4	59.4	44.6	32.6	24.2	41.2	Signal Service.
Kimball	....	....	....	....	46.4	61.0	....	63.8	52.5	....	....	....	....	A. S. Stuver.
Meade, Fort	14.1	27.7	22.1	....	....	69.3	....	66.5	58.9	44.8	24.5	24.5	....	U. S. post hospital.
New England City	....	....	....	....	....	....	73.0	63.8	54.1	38.5	25.7	18.1	....	Lewis A. Dodge.
Parkston	3.2	19.5	23.3	47.2	52.1	67.6	76.9	....	....	....	31.9	24.0	....	John J. Swartz.
Pembina, Fort	....	....	....	....	....	....	69.8	....	53.8	41.0	25.8	15.2	....	U. S. post hospital.
Randall, Fort	6.0	22.9	27.5	51.4	....	....	....	70.0	60.9	47.0	35.2	27.7	....	Do.
Rapid City	10.7	28.5	24.9	49.6	49.4	63.9	71.2	66.2	61.8	44.4	31.0	29.0	44.2	Signal Service.
Richardton	4.2	11.8	....	....	46.6	63.3	69.8	....	....	....	....	....	....	Professor A. Nordberg.
Sisseton, Fort	−6.8	6.4	13.3	39.6	49.0	63.9	70.1	64.2	58.3	43.2	30.9	22.3	37.9	U. S. post hospital.
Sully, Fort (1)	0.8	18.3	20.7	49.9	53.5	68.3	76.0	69.8	65.2	48.8	35.6	22.8	44.1	Do.
Sully, Fort (2)	1.5	17.8	20.5	49.7	52.3	67.3	75.4	69.2	62.4	47.1	33.5	25.8	43.5	Signal Service.
Totten, Fort (1)	−10.1	3.2	7.9	35.1	46.7	61.2	67.4	62.8	56.2	41.6	25.8	19.4	34.8	Do.
Totten, Fort (2)	−12.4	3.8	9.2	35.9	47.9	62.6	67.8	63.8	57.1	43.3	27.0	20.4	35.5	U. S. post hospital.
Webster	−1.7	11.9	19.4	43.1	52.1	66.8	74.2	66.5	58.0	43.0	32.0	22.9	40.7	Prof. Arthur Betts.
Woonsocket	....	....	....	45.5	51.2	68.4	75.1	67.9	58.7	42.0	28.7	22.1	....	L. O. Libbey.
Yankton	4.6	21.7	23.5	48.2	52.3	68.6	76.4	70.6	62.7	48.6	36.2	29.1	45.2	Signal Service.
Yates, Fort (1)	−4.8	15.2	16.5	46.9	50.7	66.1	72.8	67.6	61.8	46.5	29.4	26.3	....	Do.
Yates, Fort (2)	....	....	....	46.6	....	66.4	73.0	67.9	58.0	47.9	29.1	21.8	....	U. S. post hospital.
Delaware:														
Kirkwood	....	....	....	....	....	....	....	....	....	50.0	43.3	33.0	....	William Carnagy.
Newark	....	....	....	....	....	....	....	....	57.1	48.7	44.7	34.2	....	Prof. George A. Harter.
District of Columbia:														
Kendall Green	26.8	....	....	54.0	61.9	....	76.4	....	....	52.2	47.0	35.8	....	Deaf and Dumb Institution.
Rock Creek Bridge	32.5	38.6	42.1	56.7	68.8	78.2	78.8	80.0	68.2	56.3	....	....	....	Washington Water Works.
Washington Reservoir (rec.)	29.6	35.4	37.7	53.4	65.4	75.9	75.6	76.9	65.4	53.0	....	....	....	Do.
Washington Reservoir (dis.)	29.9	35.6	36.8	54.4	64.8	75.9	76.0	77.0	65.4	53.9	....	....	....	Do.
Washington	29.2	35.7	37.4	52.9	62.7	73.0	73.6	75.8	64.8	52.6	47.4	37.5	53.6	Signal Service.
Florida:														
Altamonte	61.4	63.0	64.6	[g]74.4	....	80.8	90.3	80.6	76.5	72.7	65.5	57.2	....	E. P. Tebeau.
Alva	62.0	64.3	64.0	70.4	74.0	76.4	78.3	78.0	76.1	74.8	68.4	60.2	70.6	Charles E. Robins.
Archer	....	62.0	63.5	....	....	81.7	82.2	85.0	79.1	70.6	62.9	56.0	....	Dr. J. C. Neal.
Cedar Keys	59.3	61.6	61.4	70.6	75.3	80.1	82.2	81.1	77.2	71.6	63.4	54.9	69.9	Signal Service.
Duke	55.6	61.6	59.3	68.2	72.2	76.2	....	80.2	76.0	77.0	....	....	....	Bennett P. Ferrill.
Fort Meade	60.0	64.0	63.0	73.0	78.0	84.0	82.0	86.0	80.0	71.0	60.0	53.5	71.2	A. H. Adams.
Homeland	65.1	66.3	67.1	74.6	78.0	81.3	82.7	82.5	79.8	74.8	67.6	59.8	73.3	J. S. Wade.
Jacksonville	57.2	60.2	60.3	70.1	74.2	79.2	81.9	82.5	77.0	69.9	61.6	53.6	69.0	Signal Service.
Jupiter	68.4	68.4	68.1	72.9	76.3	79.4	81.4	81.9	79.4	76.8	70.9	63.4	73.9	Do.
Key West	71.8	72.4	71.3	75.7	78.5	81.9	82.1	83.4	81.4	78.4	73.9	66.8	76.5	Do.
Limona	65.2	69.4	67.6	75.0	79.9	83.4	....	....	....	....	....	....	....	J. G. Knapp.
Manatee	63.0	65.9	65.7	76.6	77.1	81.8	84.3	83.0	81.7	75.2	69.0	59.8	73.6	Mrs. Mary W. Broberg.
Merritt's Island	63.5	64.8	65.0	71.9	75.2	78.3	80.2	81.5	78.4	75.5	67.9	59.5	71.8	Rev. J. H. White.

Table of monthly and annual mean temperature for 1888, *etc.*—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Florida—Continued.														
Micco									80.4	73.9	62.4	60.4		Signal Service.
Pensacola	55.8	58.9	59.5	69.9	73.3	78.4	82.2	79.9	76.2	69.0	59.9	52.3	67.9	Do.
St. Francis Barracks	57.0	60.0	60.1	69.7	74.2	78.6	80.8	81.4	77.0	71.6	62.3	55.3	69.0	U. S. post hospital.
Tallahassee	56.5	57.0	60.1		74.5	79.3	81.7	80.8	74.7	66.8	57.5	52.0		Rev. W. H. Carter.
Titusville	62.5	63.7	63.4	71.6	75.3	78.7	80.4	80.6	78.0	72.7	66.2	57.6	70.9	Signal Service.
Georgia:														
Andersonville	50.4						73.8	77.9	73.2	62.7	54.3	51.6		H. W. Bryant.
Athens	43.5	47.3	49.8	63.9	69.0	76.3	79.0	78.2	68.1	56.9	51.5	42.1	60.5	Prof. L. H. Charbonnier.
Atlanta	45.0	49.0	50.6	64.1	68.1	74.8	79.2	78.5	68.8	58.2	52.4	43.5	61.0	Signal Service.
Augusta	48.5	51.4	54.0	66.4	71.9	78.8	82.2	81.6	73.2	62.2	54.8	46.2	64.3	Do.
Chauncey	55.2	58.0	61.0	73.9	79.2									Report of Commissioner of Agriculture.
Duck								72.1	66.7	63.5	48.9	39.3		A. L. Gillespie.
Forsyth	50.4	54.0	55.9	68.8	72.3	79.1	82.1	81.0	72.8	64.4	56.9	49.3	65.6	Thomas G. Scott.
Gainesville		47.1	49.1	63.3										Report of Commissioner of Agriculture.
Hephzibah									61.5	62.1	58.3	50.7		R. L. Rhodes.
La Grange	46.7	47.9	52.1	65.8	59.2	76.7	80.0	78.6						Report of Commissioner of Agriculture.
Marietta	43.4	47.9			64.3	75.0	78.0	77.5	66.0	57.0	51.0	41.5		Philip A. Cobb.
Milledgeville	47.0	52.0	52.8	66.5	72.0	78.6	81.4	77.4	72.5	61.5	53.9	46.1	63.5	S. A. Cook.
Mossy Creek	33.5		29.0	47.0	70.0	77.0	70.0							Report of Commissioner of Agriculture.
Quitman (10 miles southwest of).	55.7	58.0	59.2	70.5						67.4	59.2	51.5		J. L. Cutler.
Rome	43.0	49.0	51.0	62.0	69.0		81.0	81.0						Report of Commissioner of Agriculture.
Savannah	52.5	55.2	56.4	66.6	72.5	77.1	80.8	80.6	74.6	65.6	57.8	49.7	65.8	Signal Service.
Thomasville							79.2	83.0	70.5					C. S. Boudurant.
Thomson	48.7	51.1	53.1	62.1	67.1									Signal Service.
Idaho:														
Boisé Barracks	18.0	40.2	41.4	62.0	61.7	65.5	75.6	75.7	68.4	55.0	38.6	35.4	53.1	U. S. post hospital.
Boisé City	17.7	40.3	42.7	56.5	59.9	64.2	73.3	72.8	68.0	53.2	38.8	37.0	52.0	Signal Service.
Sherman, Fort	16.3			47.6	64.8		66.0			48.7	36.1	33.2		U. S. post hospital.
Illinois:														
Albion	26.5	31.1	39.4	56.1	63.1	73.4	78.8	73.8	63.8	52.0	43.7			State weather service.
Aledo		21.2	32.5				75.4		60.2	46.6	36.4	30.1		Do.
Aurora	8.3	20.8	29.0	46.0	54.2	69.4	72.1	[illegible]	59.0	47.4	38.7	31.0	45.7	M. M. Robbins.
Beason	18.2	28.1	34.9	50.5	56.8	69.2	75.2	69.2	59.3	48.0	39.4	32.2	48.4	State weather service.
Belvidere	8.7	18.8	27.4	45.6	54.0	69.1	73.6	68.6	58.3	47.3	38.7	30.4	45.0	Do.

Benton	30.1	34.3	43.8	60.8	65.0	73.7	79.0	73.2	65.0	52.5	39.7	36.5	54.5	State weather service.
Brush Hill	...	...	...	52.3	59.7	73.6	77.8	73.0	62.9	51.8	42.1	34.9	...	Do.
Cairo	31.7	37.5	44.9	61.4	64.6	72.9	80.0	76.0	67.4	55.8	46.7	39.4	56.5	Signal Service.
Cedarville	10.3	18.0	25.6	45.7	53.5	67.7	72.6	68.7	57.5	46.5	37.1	28.4	44.3	State weather service.
Centralia	...	31.0	41.0	60.5	60.0	73.0	...	75.0	65.0	53.0	46.0	34.0	...	Do.
Charleston	21.3	28.1	35.2	53.2	60.8	72.1	79.7	77.4	68.6	49.9	41.9	33.5	51.8	J. B. Dazey.
Chicago	15.1	23.0	30.5	45.4	52.6	67.4	72.6	69.4	59.8	49.1	41.6	32.2	46.6	Signal Service.
Collinsville	22.5	32.6	38.4	57.4	61.4	71.6	77.5	73.5	64.0	53.2	43.6	36.0	52.6	Dr. J. L. R. Wadsworth.
Dwight	13.0	23.1	31.6	49.9	57.1	70.2	76.7	73.0	61.9	49.6	40.3	31.4	48.2	State weather service.
Eberle	...	...	35.0	...	61.2	...	77.2	...	...	...	43.2	...	...	Do.
Fairfield	32.2	35.2	44.3	60.2	65.2	77.5	81.2	74.3	67.0	57.1	48.7	40.1	56.9	Do.
Flora	25.0	32.0	38.0	54.0	59.0	73.0	78.0	73.0	62.0	51.0	43.0	36.3	52.0	Do.
Gibson City	16.4	26.4	32.3	50.5	58.0	68.3	...	...	...	48.2	40.0	31.9	...	Do.
Golconda	29.6	35.3	43.4	60.5	65.7	73.6	79.5	76.7	67.3	55.6	47.7	38.3	56.1	Do.
Greenville	22.0	29.8	38.2	55.9	60.9	71.8	76.8	68.7	63.3	51.5	43.2	34.5	51.4	Do.
Griggsville	16.9	26.0	34.5	53.4	61.0	70.6	78.0	74.1	65.1	53.5	43.2	34.0	50.9	Do.
Harrisburg	30.1	35.5	43.8	...	...	...	...	...	...	...	...	...	...	Do.
Hennepin	11.5	21.1	31.1	49.2	56.2	68.9	74.7	71.0	60.3	47.3	39.4	31.7	46.9	Do.
Hoopeston	16.8	25.3	34.5	49.6	56.8	...	...	...	...	...	...	...	...	Do.
Irishtown	25.0	32.5	40.2	58.0	63.0	72.2	79.3	73.8	63.5	52.6	44.8	37.2	53.5	Do.
Jacksonville	18.2	27.9	36.1	54.7	60.2	71.5	77.4	72.7	61.6	51.9	41.6	34.1	50.7	Philip J. Hasenstab.
Joliet	14.7	23.4	33.4	47.9	57.9	68.7	72.4	65.5	58.0	48.3	...	...	...	State weather service.
Jordan's Grove	24.9	32.0	41.2	58.8	64.5	73.5	79.3	74.3	65.5	53.8	43.1	36.2	53.9	Do.
Kampville	...	...	...	58.5	63.7	75.8	80.3	73.6	...	51.2	41.9	34.4	...	Do.
Lacon	14.8	24.6	33.1	52.2	59.2	71.5	78.2	74.2	62.5	48.5	41.8	34.5	49.6	Do.
Lake Forest	13.2	20.8	28.7	43.2	52.1	66.6	70.7	67.9	58.0	46.9	39.7	30.7	44.9	Do.
Lanark	7.5	18.0	27.4	50.0	56.0	70.5	76.6	71.0	62.0	50.5	40.5	...	...	Do.
McLeansborough	27.0	33.6	41.4	58.5	63.4	73.8	78.2	74.0	63.5	53.4	45.2	37.1	54.1	Do.
Mahomet	16.9	26.6	...	...	58.0	68.7	74.5	...	...	...	40.7	34.3	...	Do.
Martinsville	...	30.2	35.9	55.7	...	75.2	...	73.0	61.9	53.2	40.3	...	...	Do.
Mascoutah	23.0	...	...	55.0	...	74.0	79.4	71.6	64.5	55.9	45.1	...	...	Do.
Mattoon	23.0	29.5	35.0	50.0	60.0	73.0	77.0	70.8	61.0	50.0	42.0	34.0	50.4	William Dozier.
Mount Morris	13.3	23.2	28.2	48.1	56.1	71.1	81.9	72.2	59.1	46.2	39.0	31.2	47.5	William Feary.
New Athens	25.6	31.7	40.5	57.3	64.7	75.8	82.4	74.5	66.0	54.5	44.6	36.5	54.5	State weather service.
Old Du Quoin	20.7	34.1	43.4	61.0	65.2	76.3	81.6	76.4	66.8	55.0	45.0	37.8	55.3	Do.
Olney	25.1	31.5	39.0	55.0	63.0	74.0	77.2	73.5	63.0	52.0	43.0	34.9	52.6	Do.
Oneida	11.2	21.3	30.9	49.5	56.0	70.4	76.0	69.7	58.5	47.8	38.7	30.8	46.7	Do.
Oquawka	7.3	20.0	31.2	57.7	59.4	73.6	79.0	73.2	68.2	50.9	44.7	33.9	49.9	Do.
Oswego	12.4	21.2	28.2	45.0	54.0	68.1	73.6	68.7	56.3	46.3	37.2	29.1	45.0	John S. Seeley.
Ottawa	12.3	21.5	29.4	46.2	56.2	68.1	72.6	67.4	57.0	46.2	36.8	30.3	45.3	State weather service.
Palestine	22.5	33.2	33.3	56.9	60.3	...	78.5	74.2	61.4	51.7	42.9	...	...	John E. Templeton.
Pana	16.3	24.4	30.7	48.5	55.5	65.2	75.0	72.7	63.2	54.2	37.8	36.7	48.4	State weather service.
Paris	20.0	28.0	34.0	50.2	59.7	70.0	75.0	70.4	60.1	49.0	41.0	33.2	49.2	Do.
Payson	17.5	29.2	36.7	...	...	...	...	...	...	...	...	...	...	Do.
Pekin	16.0	26.7	35.1	54.3	60.7	72.5	78.5	73.5	62.7	51.8	...	33.8	...	Rev. J. E. Terborg.
Peoria	18.5	28.4	37.1	53.6	61.5	74.4	79.7	72.9	61.9	51.3	41.9	34.2	51.3	Dr. Fred Brendel.
Philo	18.6	23.5	33.6	52.2	58.7	71.3	76.0	71.0	62.0	49.0	41.0	32.3	49.1	State weather service.
Pontiac	14.5	23.1	31.1	49.0	56.5	66.0	77.1	72.5	61.4	49.6	40.9	32.2	47.8	Do.
Prairieville	11.1	20.1	29.2	48.2	56.1	...	...	...	...	...	...	...	...	Do.
Richview	24.7	31.9	40.1	56.8	61.9	71.9	77.8	73.2	65.4	53.8	44.3	36.8	53.2	Do.
Riley	8.1	17.5	26.1	43.7	51.7	66.7	70.7	66.1	56.4	45.4	37.1	27.9	43.1	John W. James.
Rockford	9.1	18.9	27.1	45.8	53.5	68.9	71.4	67.4	58.5	49.0	38.2	29.7	44.8	T. C. Robertson.

Table of monthly and annual mean temperature for 1888, *etc.*—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Illinois—Continued:														
Sandwich	14.8	23.8	32.2	49.9	58.7	72.5	76.7	72.5	61.6	51.0	41.3	32.6	49.0	Dr. N. E. Ballou.
South Evanston	11.4	20.2	29.2	41.2	50.6	65.8	70.8	69.0	58.3	46.6	40.8	......	......	Dr. M. D. Ewell.
Springfield	17.5	27.3	35.4	53.4	58.8	69.8	76.4	71.4	63.0	50.9	42.0	34.2	50.0	Signal Service.
Sterling	9.8	20.1	29.0	49.0	55.8	......	......	......	......	......	......	......	......	State weather service.
Sumner	25.2	31.2	39.5	56.2	64.0	75.0	80.0	76.4	66.8	51.4	41.3	32.2	53.3	Do.
Sycamore	10.3	18.9	27.9	44.3	52.9	67.1	72.6	66.3	54.9	45.3	37.1	29.9	44.0	Roswell Dow.
Three Mile	26.2	32.9	38.5	55.4	......	......	......	......	......	......	......	......	......	State weather service.
Vandalia	24.0	31.0	38.7	56.0	62.2	73.2	78.2	73.0	63.0	51.4	42.4	36.0	52.4	Do.
Wapella	20.5	24.0	36.0	55.0	......	......	......	......	......	......	41.0	34.0	......	Do.
Warren	......	15.8	23.2	47.5	53.4	......	......	......	......	......	......	......	......	Do.
Watega	13.4	17.2	29.4	53.6	......	......	......	......	......	......	......	......	......	Do.
Watseka	15.0	24.3	32.2	48.9	57.2	69.9	74.7	69.1	59.2	47.6	39.8	31.6	47.5	Do.
Wheeling	15.1	21.3	30.0	45.9	52.8	......	......	......	......	......	41.8	......	......	Do.
White Hall	19.5	29.4	38.2	57.9	63.2	74.7	80.8	75.2	65.3	53.8	43.0	......	......	Do.
Willow Hill	......	......	......	......	......	......	......	74.5	63.0	52.0	44.2	36.6	......	Do.
Winchester	18.1	31.0	40.0	59.1	59.7	73.5	80.0	75.6	66.0	54.9	44.1	36.4	53.6	Do.
Windsor	20.2	27.2	36.2	50.3	60.1	71.1	76.6	72.2	63.2	51.5	42.2	34.6	50.4	A. H. Hatch.
Winnebago	......	......	......	46.2	56.3	70.7	77.9	73.0	57.4	48.0	38.3	30.0	......	State weather service.
Woodstock	7.1	17.0	26.2	......	......	......	......	......	55.2	......	......	25.7	......	Do.
Indiana:														
Angola	18.1	22.1	30.7	46.5	61.9	70.6	73.4	69.5	61.0	46.7	40.6	32.3	47.8	Do.
Blue Lick	......	......	39.9	56.5	60.9	70.2	76.3	73.5	64.0	51.2	45.9	37.1	......	Do.
Brookville	26.0	......	36.2	......	61.0	73.1	73.9	......	......	......	......	......	......	Do.
Butlerville	26.8	32.9	37.8	56.5	64.5	75.7	75.9	75.5	64.7	51.6	45.5	36.5	52.8	C. F. Hole.
Columbia City	17.8	25.3	31.6	49.3	57.9	......	75.1	72.2	62.1	47.8	40.8	32.2	......	State weather service.
Columbus	25.0	30.3	36.1	52.4	61.4	76.8	76.4	73.0	62.2	48.7	41.9	34.1	51.5	Do.
Connersville	25.0	31.1	36.2	52.8	60.3	72.2	74.3	69.1	60.7	48.7	43.0	34.9	50.7	Robert Hessler.
Crawfordsville	21.7	29.3	......	52.2	59.9	72.3	......	......	......	......	43.0	36.0	......	State weather service.
Degonia	29.7	35.1	43.4	58.2	63.3	73.5	77.4	75.1	66.5	52.8	45.9	38.1	54.9	Do.
Delphi	18.5	27.2	33.6	50.1	59.7	74.4	76.6	71.6	60.5	48.8	40.4	33.1	49.5	Do.
Farmland	23.6	29.4	35.1	50.7	59.7	72.4	75.7	71.1	61.5	49.4	43.7	35.0	50.6	Do.
Fortville	22.5	28.6	34.0	50.9	58.8	73.8	77.2	......	......	......	......	......	......	Do.
Franklin	24.4	31.1	36.4	53.2	61.8	74.0	76.4	......	62.7	49.4	43.1	......	......	Do.
Huntingburgh	27.2	30.0	38.3	......	63.4	74.0	......	74.7	......	52.8	45.2	38.6	......	Do.
Indianapolis	23.8	30.5	35.7	52.6	60.5	72.9	75.7	72.8	63.2	50.5	44.0	35.3	51.4	Signal Service.
Jeffersonville	30.1	35.9	41.1	58.1	64.4	75.5	78.3	74.1	64.7	51.7	46.1	37.4	54.8	J. C. Loomis.
Laconia	28.7	34.1	40.6	58.3	63.4	77.6	78.1	75.2	64.1	51.3	45.1	35.8	54.4	Lafe Crozier.
La Fayette	18.6	27.2	33.5	50.6	58.5	70.8	74.8	70.8	61.7	48.5	41.2	33.0	49.0	Purdue University.
La Grange	16.0	22.7	28.8	46.2	55.4	67.5	72.5	69.0	......	......	39.8	32.6	......	State weather service.
Logansport	20.0	28.4	34.8	52.0	60.9	75.2	78.0	74.4	......	......	42.6	......	......	Thomas B. Helm.

Marengo	32.3	36.8	43.2	65.8	62.7	74.3	78.6	74.4	66.4	54.0	48.2	39.5	56.4	State weather service.
Marion	....	....	....	49.8	59.0	71.9	73.0	70.8	59.4	....	40.0	31.9	....	Do.
Mauzy	21.9	28.5	32.1	48.8	59.3	72.2	73.7	68.6	56.5	44.9	38.7	30.4	48.0	Do.
Mount Vernon	28.9	38.5	42.6	60.2	65.8	75.7	81.1	79.0	67.1	44.1	47.0	38.3	55.7	Do.
Muncie	19.6	27.2	32.1	52.2	57.6	71.3	75.8	....	....	....	....	....	....	Do.
Princeton	26.6	32.0	44.3	55.8	63.5	76.7	80.1	75.6	64.1	52.4	44.9	38.2	54.5	Do.
Richmond	24.1	29.1	32.8	52.0	60.8	71.0	73.8	71.1	60.4	46.8	41.2	32.8	49.6	Do.
Rockville	22.0	36.0	35.0	52.0	59.9	76.4	77.2	68.7	63.0	52.0	44.2	34.8	51.8	Do.
Salem	27.5	33.1	38.9	56.2	63.2	73.5	78.1	72.7	65.2	47.6	44.6	35.5	53.0	J. W. May.
Scalesville	....	....	....	....	....	....	80.1	77.8	67.1	....	47.5	38.1	....	Urias Wilson.
Seymour	30.4	35.9	40.1	55.8	62.7	74.7	77.8	78.9	65.0	52.2	46.2	37.8	54.4	State weather service.
Spiceland	24.5	30.5	35.8	52.5	....	....	....	....	....	48.7	42.8	35.8	....	Do.
Sunman	25.3	30.9	36.8	53.1	61.8	72.8	74.5	71.2	61.1	48.0	43.4	33.7	51.0	Do.
Terre Haute	24.7	31.8	38.5	55.0	62.2	73.0	76.5	73.2	63.4	52.4	45.7	36.7	52.8	Signal Service.
Vevay	29.9	33.8	39.8	56.1	62.2	74.2	76.7	74.1	64.8	51.7	46.8	37.4	53.9	State weather service.
Worthington	25.3	31.0	37.3	54.9	61.2	70.9	74.2	71.1	61.7	50.3	43.6	35.1	51.4	Do.
Indian Territory:														
Gibson, Fort	32.5	40.6	46.9	65.3	67.9	77.3	81.8	79.9	70.4	61.5	50.2	44.9	59.9	U. S. post hospital.
Reno, Fort (1)	29.7	41.7	46.4	62.6	65.7	76.4	80.6	79.8	71.9	60.3	46.2	42.8	58.7	Signal Service.
Reno, Fort (2)	28.7	41.1	43.9	60.9	64.8	75.6	79.4	....	71.1	65.6	45.2	42.0	....	U. S. post hospital.
Sill, Fort	31.9	43.2	45.9	62.7	66.6	76.5	80.0	79.4	70.4	59.3	46.8	44.4	58.9	Signal Service.
Supply, Fort (1)	31.4	44.2	44.2	61.6	63.0	78.0	82.5	79.1	71.6	58.4	47.9	44.7	58.9	Do.
Supply, Fort (2)	....	....	....	....	62.0	74.1	82.9	78.9	....	57.4	42.6	40.3	....	U. S. post hospital.
Iowa:														
Amana	....	....	27.8	49.8	54.1	69.7	75.6	69.8	58.2	47.8	36.7	27.0	....	Conrad Schadt.
Ames	0.5	20.5	23.4	49.1	43.0	68.4	75.2	69.6	59.5	47.4	....	28.3	....	J. Rush Lincoln.
Auburn	7.9	26.3	29.6	56.2	56.8	76.2	....	....	....	....	....	....	....	Edwin Miller.
Bancroft	0.7	14.4	21.1	44.5	51.4	65.7	....	68.1	58.2	....	....	24.8	....	H. N. Renfrew.
Cedar Rapids	9.2	20.6	27.8	48.6	52.5	69.8	76.0	68.1	58.6	47.8	36.5	28.8	45.4	H. D. Olds.
Clarinda	15.2	31.7	30.7	53.4	57.6	70.8	79.4	73.0	63.0	49.3	38.5	32.4	49.6	A. S. Van Sandt.
Clear Lake	2.5	15.4	21.6	43.7	49.0	74.0	76.0	69.0	56.0	48.5	34.0	25.8	43.0	Dr. J. C. Wright.
Clinton	8.4	18.6	28.6	43.5	55.3	70.2	74.5	69.4	58.0	46.4	37.5	29.4	45.0	Luke Roberts.
Cresco	−0.8	12.9	19.6	42.5	49.9	67.8	72.2	70.0	55.8	44.1	32.8	23.9	40.9	Gregory Marshall.
Cromwell	[a]4.5	21.6	27.1	48.3	[b]53.2	68.2	[a]76.1	70.4	59.5	45.3	35.1	26.7	44.7	E. E. & H. C. Harrison.
Davenport	9.7	20.8	30.1	49.5	55.2	69.6	76.2	71.3	60.8	49.4	40.1	32.0	47.1	Signal Service.
Denmark	....	29.3	....	....	61.7	74.7	....	....	....	55.4	....	....	....	G. B. Brackett.
Des Moines	6.9	22.6	29.0	51.0	54.5	68.6	77.1	71.3	61.8	49.8	38.8	30.4	46.8	Signal Service.
Des Moines (5¼ minutes southeast of).	6.5	22.9	30.8	51.7	55.6	68.5	76.5	70.9	60.8	49.6	39.0	31.4	47.0	Adolphus Voegeli.
Dubuque	7.0	18.8	26.7	47.9	53.9	69.1	75.4	70.8	59.6	48.5	39.0	29.9	45.6	Signal Service.
Dysart	6.8	11.0	25.2	46.6	52.0	70.1	72.4	[a]68.2	54.6	44.0	32.6	24.1	42.3	Joseph Dysart.
Elkader	3.0	18.2	25.1	47.5	53.0	68.6	74.1	69.0	58.7	46.6	35.8	26.8	43.9	J. N. Hamilton.
Fairfield	10.5	24.3	29.6	49.2	54.6	68.4	....	....	....	....	....	....	....	George D. Clark.
Fayette	....	....	....	....	....	68.2	71.3	65.8	55.7	43.4	34.6	26.6	....	R. Z. Latimer.
Fort Madison	11.6	21.9	32.7	53.7	59.7	73.1	78.8	72.4	61.3	49.9	40.0	33.4	49.0	Miss L. A. McCready.
Glenwood (1)	6.7	25.8	29.9	56.3	59.1	73.2	81.1	74.5	65.6	52.5	39.2	32.2	49.7	Seth Dean.
Glenwood (2	10.0	27.3	32.6	55.2	59.9	73.1	82.2	75.1	63.2	50.9	38.5	31.9	50.0	A. Schappel.
Grinnell	....	....	....	....	54.1	72.8	77.2	70.2	59.5	48.0	38.4	29.0	....	Prof. S. J. Buck.
Hampton	....	....	....	46.2	50.0	64.5	73.0	67.0	55.5	47.1	33.4	24.5	....	E. C. Grenelle.
Humboldt	6.4	16.4	22.9	34.6	51.5	69.2	75.6	69.4	60.5	43.8	33.5	[d]25.7	42.5	Miss Florence Prouty.
Independence	4.8	16.0	25.2	46.6	52.5	68.5	78.2	69.0	57.4	46.2	36.5	28.9	43.7	Iowa Hospital for the Insane.
Iowa City	....	....	29.7	46.4	52.5	66.2	72.4	72.3	62.1	46.5	41.1	29.8	....	Prof. A. A. Veblen.

Table of monthly and annual mean temperature for 1888, *etc.*—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Iowa—Continued.														
Keokuk	13.6	25.7	34.2	53.2	58.0	70.3	77.1	72.1	62.8	51.4	41.8	34.0	49.5	Signal Service.
Logan	7.2	20.8	29.0	53.4	57.4	70.8	79.4	73.6	64.4	50.9	38.8	31.5	48.1	Mrs. M. B. Stern.
Manson	21.7	28.0	24.4	48.0	55.2	70.1	82.0	77.0	63.0	49.0	36.0	26.8	48.4	W. L. Thompson.
Maquoketa*					65.9	79.0	86.0							A. B. Bowers.
Monticello	6.7	18.1	26.5	47.3	53.9	69.9	75.3	69.5	58.4	46.2	36.9	28.6	44.8	H. D. Smith.
Mount Pleasant						72.0	75.0	71.2	61.2	49.7	38.8	31.2		Prof. Max E. Witte.
Mount Vernon	5.9	18.9	28.4	51.0	57.2	74.5	78.4	72.0	61.8		38.1	28.2		Prof. Alonzo Collin.
Muscatine	9.6	20.9	30.6	50.8	55.0	63.2	74.2	70.7	59.2	48.5	38.5	31.2	46.0	J. P. Walton.
Osceola	5.2	16.3	24.2	48.0	52.3	61.6	71.2	65.5	56.6	42.6	29.4	22.3	41.3	F. M. Kyte.
Oskaloosa (1)	7.5	20.9	29.8	52.5	56.5	69.7	76.4	71.1	61.1	50.2	39.1	32.0	47.2	Joseph Boyd.
Oskaloosa (2)	9.1	23.5	32.3	51.5	58.8	73.2	77.9	72.5	62.2	52.0	42.8	33.7	49.1	O. H. Avey.
Sac City	1.8	18.4	23.7	47.1	50.3	66.1	74.3	67.2	56.9	45.7	32.3	26.4	42.5	Caleb Brown.
Vinton			26.3	47.2	52.5	67.9	73.6	68.5	57.0	45.4	36.0	28.1		T. F. McCune.
Washington	7.8	20.8	30.0	50.5	59.4	74.0	79.4	73.4	*59.9	48.0	37.0	28.0	47.4	William A. Cook.
Webster City	4.8	19.9	26.0	47.7	51.2									E. N. and George W. Lee.
Wesley		16.3					74.2	71.3	62.7	48.7	33.3	24.2		William Ward.
Kansas:														
Brookville	21.0	38.0	39.0		62.0	79.0	83.7	76.9		56.0				State weather service.
Buffalo Park	24.0	41.0			59.0	70.0								Do.
Bunker Hill	24.0	43.0			64.0					52.3				Do.
Carneiro	19.0	36.0			62.0	75.0	84.0							Do.
Cawker City	15.0	31.0	33.8	56.0	59.0	74.0	82.0	75.2	65.5	51.0	37.0	33.5	51.1	Do.
Colby									63.4	48.2	35.1	32.5		Do.
Coldwater							81.0	78.0			42.0	26.8		Do.
Collyer	19.0	38.0	36.0	58.0	60.0	70.0	78.0	74.4	66.0	50.7				Do.
Concordia	15.5	32.4	33.5	55.7	58.9	72.8	80.7	74.1	66.2	53.2	40.2	36.2	51.6	Signal Service.
Dodge City	22.8	37.7	36.5	56.9	60.5	74.5	80.0	74.4	67.8	55.1	41.2	38.4	53.8	Do.
Dorrance		46.0			65.0			82.0	71.0	59.4	42.8	38.4		State weather service.
East Norway	20.5	30.8	38.0	56.0	59.7		81.3							S. E. Hardy.
Elco										56.0	39.9	35.9		State weather service.
El Dorado	20.2	36.5		57.6										H. C. Ford.
Elk Falls	26.1	34.6	43.4	59.8	64.6	74.2	81.2	78.5	70.8	59.9	45.3	39.0	56.4	Dr. A. C. Williams.
Ellis	20.0	35.0			64.0					54.7				State weather service.
Ellsworth	22.0	35.0			64.0				71.0					Do.
Emporia	20.7	34.9	38.8	55.8	61.9	75.6	81.0	85.0	68.0		40.3	36.3		Prof. T. H. Dinsmore, jr.
Englewood						78.2	83.7	77.7	69.6	57.2	42.8	39.4		C. D. Perry.
Eustis (Goodland)	18.0	34.4	31.3	53.0	55.7	70.0	77.0	69.4						State weather service.
Gibson	15.0	35.1	34.0	55.0	58.0	74.0	80.0	75.8	66.8	52.1	37.1	34.7	51.5	Do.
Globe	19.6	31.9	36.9	56.1	61.7	73.5	79.8	73.0	65.7	53.1	38.4	34.2	52.0	Wm. Featherston.

Gove City							78.0	70.3	63.7	49.7	33.5	32.7		State weather service.
Grainfield	23.0	41.0			60.0				72.0					Do.
Grenola	23.0	37.0	41.0	60.0	68.0	76.0	83.0	78.0	65.0	55.3	40.2	36.2	55.2	Do.
Grinnell	23.0	38.0	34.0											Do.
Halstead	21.0	35.0	42.0	60.0	64.0	78.0	88.0	77.0	62.0	55.3	41.0	37.7	54.8	Do.
Havensville						[e]75.2		74.7	[d]67.5	51.1	37.5	30.7		L. W. Dennen.
Hays, Fort	19.1	35.6	34.9	55.9	59.4	75.2	80.3		66.0	53.7	38.8	37.0		U. S. post hospital.
Hays City	20.0	42.0							76.0	54.2				State weather service.
Independence	24.4	37.1	42.6	56.1	64.6	74.8	80.3	76.5	68.8	56.5	43.1	37.0	55.1	J. M. Altaffer.
Lawrence	18.0	32.7	38.6	57.8	62.1	73.1	79.5	72.9	66.0	53.1	39.2	34.8	52.3	Prof. F. H. Snow.
Leavenworth	16.3	31.4	37.0	56.5	60.5	72.2	80.0	74.2	67.0	54.5	40.7	35.8	52.2	Signal Service.
Leavenworth, Fort							79.2		66.7	54.6	41.0	35.6		U. S. post hospital.
Lebo	18.6	32.7	38.1	56.6	62.0	73.9	79.5	77.5	66.7	52.9	37.5	36.0	52.7	C. W. Burnett.
McAllister	21.0	38.0	35.0		60.0	75.0			70.0	50.7				State weather service.
Manhattan (1)	15.6	30.4	35.8	57.0	61.0	73.6	79.6	74.1						Agricultural College.
Manhattan (2)	14.6	26.7	35.2	56.5	65.0	74.8	81.3	74.2	66.0	54.0	39.4	32.0	51.6	C. P. Blachley.
Montero	20.0	38.0	37.0	54.0	57.0	77.0	81.0	72.7	69.0	53.2	32.3	37.9	52.4	State weather service.
Morse	25.3	31.7	35.7	53.5	62.3	71.8	80.3	69.0	65.1	54.4	39.0	32.2	51.7	R. P. Edgington.
Ninnescah (Cunningham)	19.0	35.0	36.6	57.8	62.5	75.1	79.8	75.8	66.0	54.8	38.3	35.8	53.0	E. Shaw.
Oakley	20.0	40.0	38.0			74.0	83.0			50.6				State weather service.
Ogallah	24.0	40.0	37.0		65.0									Do.
Quinter	19.0	38.0			60.0					55.8				Do.
Riley, Fort	16.8		37.9			75.7	82.2	75.6	67.5	53.2	40.2	35.5		U. S. post hospital.
Rome	24.0	38.0	40.0	58.0	63.0	76.0	81.0	77.8	68.0	56.9	42.7	39.0	55.3	State weather service.
Russell	23.0	40.0				77.0			71.0					Do.
Salina	23.7	36.2	36.4	55.2	64.4	78.4	84.0	81.7	70.8	60.0	43.7	38.8	56.1	John H. Gibson.
Sedan	27.0	37.0	43.0	61.0	66.0	77.0	83.0	77.2	69.3	55.2	41.9	38.2	56.3	J. W. Goodell.
Seneca							79.0	72.0	65.0	52.3	37.5	32.6		State weather service.
Topeka (1)	17.5	32.9	37.5	55.7	60.6	72.1	79.0	73.4	65.8	49.1	35.6	31.4	50.9	Signal Service.
Topeka (2)	18.0	33.0	38.0	56.0	61.0	72.0	77.0	71.0	61.3	49.1	35.6	31.3	50.3	State weather service.
Tribune	19.7	36.8	32.5	53.4	57.1	75.0	80.1	72.6	65.1	53.0	35.6	33.0	51.2	S. B. Jackson.
Victoria	19.0	39.0	37.0		65.0									State weather service.
Wakefield	18.0	33.4	36.8	58.8	62.6	76.0	82.6	76.0	67.4	54.9	40.0	37.8	53.7	William P. Cochran.
Waterville	17.0	32.0	36.0	56.0	66.0	73.6	79.6			57.7	38.4			State weather service.
Wellington	23.6	39.0	42.6	59.3	63.7	75.4	80.9	79.1	66.4	55.2	40.6	40.0	55.5	Do.
Wichita							81.5	76.4	69.0	56.6	41.6	38.6		Signal Service.
Wilson	17.6	34.5	34.4	56.2	60.6		81.0	72.8		52.2				Miss Lizzie Dolphin and E. Y. Dollenmayer.
Yates Centre	20.9	34.7	40.1	57.6	61.9	73.9	76.6	74.1	65.4	53.4	39.4	35.0	52.8	F. R. Gray.
Kentucky:														
Bowling Green	[a]34.5	42.3	46.8	61.1	68.0	77.0	84.0	79.0	68.4	56.5	50.6	39.9	59.0	M. H. Crump.
Carlisle	30.0	34.8	38.4	55.6	62.6	71.8	[c]72.2	[g]72.0		[i]47.9	[f]40.6			W. H. Fritts.
Frankfort	31.8	36.6	41.7	55.7	63.6	74.6	77.4	74.2	63.8	50.8	45.7	35.5	54.3	E. C. Went.
Lexington	31.2	36.3	40.6	55.6	62.9	72.6	75.8	74.4	62.8	51.0	45.7	36.7	53.8	Signal Service.
Louisville	32.3	37.9	43.6	59.6	65.2	75.7	78.6	76.0	66.2	54.0	48.6	38.9	56.4	Do.
Madisonville								77.2	66.8	54.1	47.1	38.6		State weather service.
Millersburg						70.6	76.3	74.2	64.8	53.5	49.6	40.6		Rev. Cadesman Pope.
Shelbyville			48.7	59.1	60.0									W. H. Stuart.
Louisiana:														
Abbeyville		60.2	58.2	72.5	75.2	78.9	82.9	81.2	79.0	72.5	60.4	53.2		State weather service.
Alexandria		55.5	56.0	69.7	72.5	78.5	82.0	81.7	75.6					Signal Service.

* One observation daily at 2 p. m.

Table of monthly and annual mean temperature for 1888, *etc.*—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Louisiana—Continued.														
Amité City				70.2	73.8	79.7	83.0	80.8	75.9	67.9		48.1		Signal service.
Baton Rouge		57.9	60.5	69.8	73.8	79.0		78.8			60.9			State weather service.
Cheneyville				68.8	69.2	73.9	80.7	77.6	76.5	62.1	57.8			Signal Service.
Clinton								76.5	73.4	65.6	55.7	46.0		State weather service.
Coushatta Chute						80.0	82.8	80.5	72.4	63.8				Signal Service.
Convent										67.3	59.7	49.2		State weather service.
Crowley										69.1	57.2	53.6		Do.
Donaldsonville	52.4	56.3	58.6					79.0		67.4	58.2	50.0		Do.
Farmerville					71.8	77.9	80.9	82.4			54.0			Do.
Franklinton								[d]79.8	77.4	68.3	59.6	52.1		Do.
Grand Coteau	51.6	58.0	59.6	70.6	74.7	78.3	81.8	79.9	75.3	67.2	58.9	53.6	67.5	Rev. C. M. Widman.
Hahnville										69.4	62.5	51.2		State weather service.
Houma										71.6	60.8	52.2		Do.
Keatchie				69.2		80.0	82.4	79.6						Do.
Lafayette				70.5	74.2	75.2	78.0	81.7	76.4	68.8				Signal Service.
Lake Charles	52.6	57.6	58.5								57.1	53.1		State weather service.
Lake Providence			61.4	75.6	76.1			86.8	79.9		62.9	56.6		Do.
Liberty Hill	49.5	56.3	55.2	83.0?	72.7	78.3	82.0	82.5	73.5	66.0	54.0	49.0	66.8	Dr. E. A. Crawford.
Luling		59.0	59.9	70.2	72.7	78.1	81.8	80.4	75.4	65.4	58.5	[e]48.9		F. M. Rogers.
Mandeville	53.2	57.5	59.4	72.0	75.6	80.3	83.7	80.8	76.6	68.2	60.9	51.2	68.3	State weather service.
Marksville					74.0	73.1	82.6	78.3	72.8	65.1	55.9	51.3		Do.
Maurepas						77.5		81.0	76.9	67.8	61.3	53.6		Do.
Melville				73.8	73.5	75.0	84.2			67.2	58.4	50.5		Do.
Minden				69.8	72.9	79.6	83.8	82.8	75.6	65.8		46.1		Do.
Monroe	44.2	52.7	53.9	66.6	74.5	80.0	83.5	81.0	73.6	62.4	55.5	49.4	64.8	Signal Service.
Morgan City	54.0	59.4	59.8	70.2	70.1	79.2	81.9	80.2						State weather service.
Mount Airy									77.3	70.2	62.7	53.9		Do.
Natchitoches			55.3	70.0	74.6	79.2	82.8	82.8	74.2	65.6				Signal Service.
New Iberia				72.0	74.1	78.8		81.1	78.6	72.0	63.4	57.8		State weather service.
New Orleans	55.6	58.6	60.3	69.9	72.8	77.3	83.6	81.0	77.6	70.8	61.8	53.8	68.6	Signal Service.
Point Pleasant	45.0	51.6	54.6	68.7		79.8	83.2	79.2	73.7	63.6	55.5	50.5		State weather service.
Port Eads	[f]59.8		62.0	72.2	77.6	81.5		81.3	78.0	73.5	65.9	56.8		Mrs. C. L. Kleinpeter.
St. Martinville			61.9		77.0		88.1		79.5	68.0	65.0			State weather service.
Shell Beach									76.9	72.5	61.4	54.2		Do.
Shreveport	44.5	51.6	54.7	69.8	72.7	78.2	82.8	81.8	74.0	65.6	55.0	49.7	65.0	Signal Service.
Sugar Experiment Station					74.8	79.5	83.5				60.4	53.6		State weather service.
Trinity				70.2	73.7		84.2	80.0	76.7	66.4				Do.
Vidalia	48.5	54.4	56.4	70.0	73.9	80.7	84.8	83.1	76.8	61.1	57.5	51.8	66.6	State weather service.

Maine:														
Bar Harbor	23.0	23.0	28.8	37.7	47.8	60.9	63.5	61.9	56.0	44.2	39.1	29.2	42.9	Joseph Wood.
Belfast	12.7	21.4	29.0	39.0	49.1	61.2	63.3	62.0	54.4	42.9	37.8	25.8	41.8	New England Meteorological Society.
Calais	....	....	....	....	....	....	....	62.7	55.4	43.8	36.7	27.4	....	Do.
Cornish	10.8	20.4	27.2	37.4	56.0	65.2	65.2	65.8	53.8	40.6	35.2	27.8	42.1	Silas West.
Eastport	13.7	22.6	29.0	36.5	45.3	54.7	58.6	59.2	53.6	43.7	37.1	28.2	40.2	Signal Service.
Fairfield	7.8	16.6	27.6	37.9	50.4	....	65.8	64.2	55.3	42.2	....	26.2	....	New England Meteorological Society.
Gardiner	12.3	21.3	28.9	38.2	49.9	63.3	67.5	64.1	55.3	42.9	36.4	28.5	42.4	H. Richards.
Kent's Hill	8.2	17.0	27.7	36.2	49.7	64.3	64.9	64.2	54.4	41.6	34.3	25.4	40.7	Wesleyan Seminary.
Lewiston	10.2	18.4	27.8	36.8	49.6	63.9	67.0	65.6	55.4	42.9	36.2	27.1	41.7	New England Meteorological Society.
Mayfield	....	....	....	....	....	63.2	63.7	61.0	50.9	36.9	29.4	27.1	....	Do.
Orono	8.6	19.0	28.0	37.5	50.4	62.8	65.1	63.5	54.8	42.1	35.7	27.9	41.3	State College.
Petit Menan	....	....	....	....	....	52.6	57.0	57.5	53.0	42.8	37.1	30.5	....	New England Meteorological Society.
Portland	14.3	23.2	29.8	39.2	48.8	63.0	65.2	65.6	55.8	43.4	38.2	29.7	43.0	Signal Service.
Maryland:														
Baltimore	29.1	35.5	37.3	52.6	62.6	73.2	74.6	76.2	65.3	52.7	47.9	37.6	53.7	Do.
Barren Creek Springs	....	....	....	....	....	74.8	73.8	76.2	66.0	50.2	48.5	27.0	....	Albert E. Acworth.
Cumberland	26.6	32.8	35.7	50.3	60.2	70.2	70.8	69.2	59.8	48.0	42.8	33.6	49.9	E. T. Shriver.
Fallston	25.8	....	33.8	49.4	....	67.5	71.0	72.8	62.4	49.3	45.2	35.1	....	Prof. G. G. Curtis.
Gaithersburgh	....	....	....	....	54.7	67.0	68.1	70.0	56.8	46.2	38.5	30.6	....	John T. De Sellum.
Galena	....	....	....	....	....	....	....	....	^{d}65.6	51.1	46.7	35.2	....	Henry Parr.
Gambrills	....	....	....	....	....	....	....	....	69.2	^{c}55.0	^{a}49.3	38.7	....	J. E. Mogue.
Great Falls	29.6	35.2	37.5	53.1	65.5	75.4	75.6	75.9	64.0	51.3	....	....	....	Washington Water Works.
Jewell	....	....	....	....	....	....	....	....	....	52.4	47.9	35.9	....	Joseph Plummer.
McDonogh	26.3	32.6	34.6	50.5	61.0	71.3	72.6	74.4	62.5	50.1	45.4	34.8	51.3	McDonogh Institute.
McHenry, Fort	27.6	34.2	37.0	51.3	60.4	71.8	73.4	76.3	63.5	57.0	50.4	37.5	53.4	U. S. Post Hospital.
Mount St. Mary's	....	34.0	36.4	50.8	61.5	70.6	71.8	72.4	60.8	52.8	45.0	34.9	....	Mount St. Mary's College.
Woodstock	27.2	32.5	35.0	50.9	61.0	71.4	71.6	72.0	^{a}76.0	49.6	^{c}44.0	^{a}34.1	52.1	Woodstock College.
Massachusetts:														
Amherst (1)	15.4	24.8	28.7	42.9	55.9	65.8	67.6	67.9	58.1	43.6	40.8	31.9	45.3	Miss S. C. Snell.
Amherst (2)	13.8	22.0	26.8	40.4	54.7	69.1	67.2	67.4	54.7	43.1	38.9	30.4	44.0	Massachusetts Agricultural Experiment Station.
Beverly Farm	14.4	21.3	27.1	38.2	48.7	60.8	69.1	65.9	55.2	43.0	38.5	29.4	42.6	New England Meteorological Society.
Blue Hill (summit)	16.4	25.1	28.2	39.7	51.0	63.9	65.6	66.4	56.0	43.9	40.2	30.5	43.9	Do.
Blue Hill (base)	18.1	26.5	30.7	41.7	53.4	65.3	66.7	68.6	57.5	45.1	41.7	32.5	45.6	Do.
Blue Hill (valley)	....	....	....	....	....	....	....	68.4	57.5	45.3	41.7	32.4	....	Do.
Boston	20.0	28.4	32.0	42.2	52.5	66.8	68.8	70.1	59.8	47.7	43.8	34.6	47.2	Signal Service.
Cambridge (1)	17.6	26.4	30.2	41.9	54.2	66.9	67.4	68.8	58.4	46.6	42.9	32.8	46.2	Harvard College Observatory.
Cambridge (2)	17.6	26.3	30.6	42.0	54.4	67.4	68.6	70.0	58.4	46.4	40.8	32.2	46.2	New England Meteorological Society.
Chestnut Hill	18.6	26.3	30.6	41.0	53.2	66.3	67.5	68.8	58.6	46.2	42.5	32.8	46.0	Do.
Concord	17.9	26.0	31.7	....	....	....	....	....	....	....	....	....	....	Do.
Cotuit	20.2	28.5	31.6	41.0	52.2	64.3	67.0	69.4	59.7	47.0	44.5	33.2	46.6	Do.
Deerfield (1)	11.7	20.2	27.0	40.7	55.0	65.5	66.5	68.4	58.9	43.6	38.2	29.1	43.7	Rev. A. Hazen.
Deerfield (2)	13.6	21.8	28.0	41.6	56.9	68.2	69.1	69.3	59.2	44.2	38.5	29.8	45.0	New England Meteorological Society.

Table of monthly and annual mean temperature for 1888, *etc.*—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Massachusetts—Continued.														
Dudley	16.3	25.2	27.9	41.4	53.9	66.9	67.9	68.3	56.8	41.2	39.2	30.1	44.6	Conant Observatory.
Fall River (1)	20.1	27.5	30.9	41.1	52.3	65.5	65.5	68.2	58.1	46.2	43.1	33.6	46.0	C. V. S. Remington.
Fall River (2)	20.1	28.7	30.7	43.0	54.8	67.8	65.5	68.2	58.6	45.6	44.0	33.8	46.7	New England Meteorological Society.
Fitchburg (1)	14.6	23.7	27.8	39.7	54.0	65.6	66.6	66.5	56.9	43.2	38.3	29.8	43.9	Do.
Fitchburg (2)	15.9	24.3	28.6	40.2	53.4	66.4	67.3	66.9	56.1	42.4	38.3	29.9	44.1	Do.
Framingham	18.1	25.8	30.8	41.8	55.2	67.4	67.8	68.1	59.4	46.4	41.7	32.6	46.3	Do.
Gilbertville	14.9	21.8	26.2	36.8	....	....	65.0	65.9	56.4	41.7	36.1	28.1	....	Do.
Groton (1)	14.1	24.0	....	....	....	....	....	....	....	42.8	40.9	....	....	Do.
Groton (2)	15.4	23.6	30.5	41.0	54.5	66.8	67.8	68.4	58.2	44.7	39.6	30.7	45.1	Do.
Heath	9.7	24.6	25.8	43.6	54.2	....	....	69.3	58.6	38.8	36.5	27.2	....	B. B. Cutler.
Lake Cochituate	17.2	25.8	30.6	40.6	53.9	66.2	67.6	69.4	59.0	46.4	41.5	32.0	45.8	New England Meteorological Society.
Lawrence	15.4	23.6	29.8	41.0	54.6	67.4	69.6	69.5	58.4	44.5	39.8	29.8	45.3	Do.
Leicester	....	....	....	....	....	....	....	....	....	43.0	38.7	28.9	....	Do.
Lowell (1)	16.2	25.6	30.2	....	....	....	....	....	....	....	....	....	....	Do.
Lowell (2)	15.9	24.3	29.7	40.7	53.9	67.3	69.0	69.2	59.2	45.1	40.8	31.4	45.5	Do.
Ludlow	12.8	22.1	25.3	39.3	52.5	63.8	64.6	66.1	57.0	42.2	38.3	28.2	42.7	Do.
Lynn	18.6	26.6	31.1	41.4	52.2	65.2	66.2	68.0	56.8	45.2	41.2	32.1	45.4	Do.
Mansfield	18.4	26.8	31.1	40.4	53.6	66.0	66.9	68.5	58.4	44.2	41.2	31.0	45.5	Do.
Marion	24.6	29.8	32.8	42.9	58.6	66.3	....	....	....	....	....	....	....	Joseph E. Hadley.
Middleborough	19.0	27.8	31.3	40.8	53.0	64.7	65.4	67.8	58.2	45.5	42.4	32.4	45.7	New England Meteorological Society.
Milton	19.7	28.0	31.8	38.5	51.2	63.6	65.5	67.1	55.9	44.1	42.3	33.4	45.1	Rev. A. K. Teele.
Milton Centre	21.1	31.6	33.6	44.6	54.4	64.0	60.4	69.5	60.4	49.4	44.5	35.8	47.4	Charles Breck.
Monson	14.8	23.8	28.1	41.0	55.5	63.6	66.6	67.7	57.3	43.8	39.4	28.9	44.2	New England Meteorological Society.
Nahant	....	....	....	....	....	63.1	64.0	67.6	57.5	....	....	....	....	Dr. William D. Hodges.
Nantucket (1)	25.8	30.8	32.4	41.8	50.5	61.2	65.2	68.2	60.7	49.4	47.1	36.8	47.4	Signal Service.
Nantucket (2)	23.6	30.0	33.0	43.4	53.3	65.0	63.8	69.4	62.7	50.2	47.4	37.5	48.3	New England Meteorological Society.
New Bedford (1)	19.7	27.9	31.0	41.7	53.1	63.6	66.2	66.6	58.0	46.8	43.0	34.4	46.0	Thomas R. Rodman.
New Bedford (2)	21.5	28.2	31.0	42.1	53.1	65.8	66.9	68.6	59.4	47.2	44.0	33.4	46.8	New England Meteorological Society.
Newburyport	17.8	26.4	31.2	41.1	51.8	65.8	67.6	67.1	57.0	45.1	41.2	32.2	45.4	T. V. Pike.
Northampton	13.8	21.8	28.0	42.6	56.0	68.6	69.9	70.4	60.4	44.5	39.4	30.4	45.5	New England Meteorological Society.
Plymouth	21.9	30.5	33.4	43.3	....	67.5	69.2	69.7	60.1	48.9	45.2	35.2	....	Do.
Princeton	....	....	25.2	38.0	....	63.9	65.0	65.4	56.1	42.1	37.3	27.2	....	Do.
Provincetown	23.2	29.9	32.5	42.0	52.0	65.6	67.8	69.0	59.4	47.7	45.0	34.7	47.4	John R. Smith.

Rowe	9.9	19.3	22.5	35.9	51.6	63.6	64.9	64.5	54.0	42.5	34.6	25.8	40.8	New England Meteorological Society.
Salem	17.9	26.7	30.5	......	51.7	65.9	67.4	68.3	57.8	44.6	41.2	32.4	......	Do.
Somerset	19.4	28.6	32.4	44.0	57.2	69.8	71.4	72.0	62.0	48.8	44.4	33.2	48.6	Elisha Slade.
Springfield	16.6	25.4	29.5	44.6	57.5	69.7	70.5	70.4	60.2	45.4	40.7	31.6	46.8	New England Meteorological Society.
Taunton (1)	20.2	29.1	32.0	42.2	......	......	67.5	68.3	58.4	46.9	43.6	33.3	......	Dr. E. U. Jones.
Taunton (2)	19.6	28.4	32.2	43.1	54.2	66.8	67.4	66.5	58.2	45.6	42.8	32.8	46.5	New England Meteorological Society.
Taunton (3)	19.9	28.4	32.0	41.2	53.6	65.8	66.6	68.9	58.6	46.0	43.0	33.0	46.4	Do.
Vineyard Haven	30.0	30.1	35.1	47.0	54.5	67.3	68.1	71.4	61.1	50.4	47.0	37.9	50.0	Signal Service.
Warwick	12.5	20.4	24.8	37.8	52.1	62.2	63.3	63.8	55.3	41.7	36.8	26.0	41.4	New England Meteorological Society.
Wellesley	18.7	26.1	30.6	40.8	54.1	66.1	65.8	68.6	59.0	44.9	40.4	33.0	45.7	Do.
Westborough	19.2	27.5	32.9	43.1	57.6	68.9	71.0	71.2	60.1	47.7	43.0	34.0	48.0	G. S. Newcomb.
Williamstown	12.8	21.0	24.5	39.6	52.7	68.3	68.5	60.0	57.3	42.4	38.4	29.4	42.9	Williams College Observatory.
Wood's Holl	21.9	28.2	31.6	41.3	50.7	61.9	65.4	67.6	60.0	49.2	45.2	34.8	46.5	Signal Service.
Worcester	17.6	22.5	27.8	39.5	53.1	66.1	68.0	67.3	56.8	40.3	39.0	27.7	43.8	J. B. Hall.
Michigan:														
Adrian	16.1	23.4	28.5	45.8	55.4	69.4	72.2	69.8	58.7	45.6	38.4	30.6	46.1	State weather service.
Albion	......	......	......	......	......	......	......	......	60.5	49.3	41.3	31.3	......	Do.
Alma	14.0	19.6	23.9	41.0	51.8	67.4	68.6	65.7	55.3	44.8	37.1	29.5	46.2	Do.
Alpena	13.6	17.2	18.6	34.5	44.5	62.0	63.8	63.2	54.2	42.4	35.2	27.8	39.7	Signal Service.
Atlantic	......	......	......	......	......	......	......	59.9	50.5	37.7	31.1	......	......	State weather service.
Bad Axe	15.1	20.9	24.2	40.0	51.6	66.7	68.8	65.5	......	......	......	......	......	Do.
Bear Lake	14.3	17.7	19.1	38.3	48.8	67.7	69.1	64.6	55.8	43.3	37.3	30.8	42.2	Do.
Bell Branch	......	23.3	28.9	43.5	57.4	71.7	73.4	71.4	......	46.8	38.9	31.3	......	Do.
Benton Harbor	17.1	17.5	25.9	43.6	54.6	66.3	71.3	67.5	56.3	......	38.7	32.0	......	A. J. McClave.
Benzonia	14.5	20.0	19.2	37.2	48.3	64.6	67.0	62.9	54.5	41.7	36.8	30.0	41.4	State weather service.
Berlin	......	......	......	......	......	......	70.3	72.3	58.5	45.4	39.5	30.1	......	Do.
Big Rapids	13.8	19.3	23.6	42.5	52.6	69.3	71.6	66.7	56.0	44.3	36.9	30.0	43.9	Do.
Birmingham	15.9	21.9	26.9	43.1	55.2	68.8	71.1	67.7	58.1	45.3	37.9	29.9	45.2	S. Alexander.
Brady, Fort	7.1	10.3	13.1	30.4	41.7	58.6	60.4	58.2	52.8	41.1	31.3	23.8	35.7	U. S. post hospital.
Bronson	......	......	......	47.8	54.3	68.4	71.6	68.6	57.3	43.5	39.6	31.7	......	State weather service.
Buchanan	15.9	21.8	28.9	46.1	54.3	67.8	71.9	69.8	55.6	45.0	38.5	30.9	45.5	Do.
Calumet	......	9.1	13.6	32.5	43.6	59.5	64.4	60.2	51.7	39.6	31.4	24.1	......	Do.
Cassopolis	17.9	24.0	29.8	46.8	56.3	70.5	74.0	69.9	58.9	47.7	40.7	32.9	47.4	Do.
Charlevoix	12.4	......	16.6	32.8	43.8	59.1	64.5	61:8	55.4	......	......	......	......	Do.
Chase	13.0	17.2	21.2	39.5	49.3	67.5	68.7	61.1	53.9	......	35.5	29.0	......	Do.
Chelsea	17.0	22.7	27.3	43.9	52.2	68.0	70.6	......	57.9	45.9	40.2	31.1	......	Do.
Coldwater	17.5	......	29.4	46.4	55.7	69.7	73.1	70.0	59.2	47.0	......	......	......	Do.
Colon	17.0	22.8	30.6	48.3	55.7	70.0	73.7	70.0	58.2	46.0	39.0	30.6	46.8	Do.
Columbia	......	......	......	......	......	......	74.3	72.5	61.7	......	......	34.5	......	Do.
Concord	17.0	23.2	27.6	45.3	54.7	68.9	73.2	......	58.5	46.2	38.2	30.4	......	Do.
Corunna	17.1	25.8	28.2	43.7	55.7	68.4	70.6	67.7	57.4	45.7	39.0	28.1	45.6	Do.
Deer Lake	......	......	......	......	......	......	......	65.1	55.2	43.2	36.5	29.0	......	Do.
Detroit	18.0	24.1	28.6	42.9	54.2	67.5	71.0	69.0	59.9	46.8	41.4	31.4	46.2	Signal Service.
East Saginaw	......	......	......	......	......	......	......	......	52.2	44.1	36.5	30.0	......	State weather service.
East Tawas	10.7	20.1	21.7	39.6	50.2	j63.8	......	......	......	......	40.2	......	......	Do.
Eden	17.2	23.8	26.4	44.3	55.1	68.1	71.0	68.8	59.4	45.8	38.8	30.9	45.8	Do.
Escanaba	7.5	11.9	15.1	35.2	45.8	60.8	68.2	65.7	56.6	44.2	36.2	27.3	39.5	Signal Service.
Evart	......	s16.8	21.1	40.0	52.9	71.1	71.9	59.9	......	......	......	......	......	State weather service.

Table of monthly and annual mean temperature for 1888, *etc.*—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Michigan—Continued.														
Fletcher	12.2	18.8	20.3	......	j49.7	69.0	71.2	66.7	55.7	41.6	35.0	27.6	......	State weather service.
Fremont	......	......	......	......	54.9	......	......	69.0	......	45.9	38.7	30.9	......	Do.
Gaylord	10.7	11.5	17.2	35.4	47.9	66.3	68.6	62.6	51.7	......	31.4	......	......	Do.
Grand Haven	17.0	21.2	24.4	41.5	50.1	63.2	68.0	64.8	55.2	45,8	39.1	32.3	43.6	Signal Service.
Grand Rapids	15.9	23.8	......	......	......	......	......	67.2	60.2	48.2	40.2	32.3	......	State weather service.
Greenville	14.7	20.4	25.4	......	......	......	......	......	......	......	......	......	......	Do.
Gulliver Lake	......	......	......	......	......	......	......	......	......	42.1	34.4	27.6	......	Do.
Hanover	17.1	24.1	28.4	45,3	55.1	69.2	72.2	69.2	58.5	46.9	40.1	31.5	46.5	Do.
Harrisville	14.1	20.8	21.3	37.0	46.6	63.4	56.0	64.7	56.0	43.7	36.5	28.4	40.7	Dr. D. W. Mitchell.
Hart	16.1	19.0	24.1	42.1	52.5	68.6	72.8	67.4	57.7	46.4	37.9	31.6	44.7	State weather service.
Hartford	18.4	23.0	26.8	42.6	55.4	71.8	......	......	......	......	......	......	......	Do.
Hastings	17.7	23.9	27.1	45.5	54.5	69.4	72.4	68.9	57.9	47.2	......	33.0	......	Do.
Highland	16.4	20.1	......	......	......	......	......	......	60.0	43.4	39.3	30.1	......	Do.
Hillman	14.1	19.7	20.3	38.9	49.3	66.9	68.1	65.9	56.3	......	......	27.1	......	Do.
Hudson	13.8	21.7	27.1	43.2	53.2	64.6	66.2	61.0	52.9	44.9	37.4	29.6	42.9	Maj. A. H. Boies.
Ionia	......	......	......	......	53.4	69.0	71.7	67.7	59.2	47.3	38.1	30.4	......	State weather service.
Jonesville	15.4	22.3	27.1	44.0	53.9	......	......	......	......	......	......	......	......	Do.
Kalamazoo	16.5	23.2	27.8	45.7	55.2	68.8	72.4	69.3	59.0	47.4	40.1	31.8	46.4	W. A. Black.
Lansing (1)	15.7	22.7	26.6	43.0	53.1	68.0	70.6	67.2	57.4	45.2	38.1	29.7	44.8	Signal Service.
Lansing (2)	15.6	22.4	27.5	44.3	53.9	68.8	71.1	67.8	57.8	46.3	39.2	31.2	45.5	Dr. H. B. Baker.
Lathrop	......	9.9	12.1	33.6	46.4	63.5	68.0	64.9	53.2	40.5	31.2	24.2	......	State weather service.
Mackinaw City	10.9	12.8	15.5	......	......	......	......	......	......	......	......	......	......	Signal Service.
Madison	15.7	22.4	27.5	43.3	54.0	68.6	70.9	68.3	58.3	45.8	38.4	30.8	45.3	State weather service.
Manistee	......	......	......	......	......	......	65.0	62.7	54.4	43.6	37.8	30.4	......	Signal Service.
Maple Hill	8.9	14.4	15.6	35.5	43.5	59.6	62.4	......	......	......	......	......	......	State weather service.
Marshall	18.3	24.9	30.3	47.1	57.1	72.2	75.1	71.5	60.8	48.2	40.2	32.6	48.2	G. H. Greene, M. D.
Marquette	8.5	12.0	14.5	33.2	43.2	57.9	64.2	61.5	53.8	42.1	35.0	26.4	41.0	Signal Service.
May	13.2	20.1	24.0	40.3	53.2	67.6	68.6	66.0	56.4	42.4	36.6	28.5	43.1	State weather service.
Mio	12.0	17.9	20.6	39.6	51.5	67.5	69.7	65.2	55.3	42.4	34.7	26.9	41.9	Do.
Mottville	16.1	21.9	29.0	45.7	54.9	69.0	72.2	69.6	59.3	47.8	39.4	32.1	46.3	J. A. Hartzler.
Mount Morris	15.2	21.3	26.0	42.5	52.4	68.2	71.1	......	......	......	......	......	......	State weather service.
Mount Pleasant	......	......	......	......	......	......	73.0	65.6	58.2	......	......	......	......	Do.
North Marshall	......	14.8	19.6	44.2	......	......	67.8	......	......	......	......	......	......	Do.
Olivet	16.5	22.6	27.5	45.6	54.2	k67.2	......	......	......	45.4	38.5	30.6	......	Do.
Omer	13.8	20.0	25.0	37.0	48.4	70.8	73.4	67.0	58.2	......	......	27.9	......	Do.
Ovid	15.6	21.8	26.5	42.9	53.2	68.3	......	n66.1	57.3	45.4	37.5	30.1	......	Do.
Paw Paw	18.3	25.0	28.2	43.2	......	......	......	......	......	......	......	......	......	Do.
Petersburgh	17.4	24.4	29.0	44.9	55.4	69.7	71.6	69.8	59.3	46.3	40.8	31.4	46.7	Do.
Petoskey	......	16.5	20.4	37.5	......	......	......	......	......	......	......	......	......	Do.
Pontiac	18.7	25.9	28.2	43.6	55.3	69.1	70.7	69.1	59.8	47.5	41.4	32.9	46.8	Do.

Port Huron	16.2	22.8	25.2	40.0	51.2	64.4	67.4	66.4	57.4	45.1	40.8	31.6	44.0	Signal Service.
Pulaski	15.7	22.8	27.8	45.8	56.1	71.7	75.6	68.9	59.2	46.8	39.9	31.8	46.8	State weather service.
Romeo	17.8	23.1	26.0	41.4	53.6					46.9	40.2			Do.
St. Johns	15.9	21.3	26.7	45.2	54.0	69.2	72.3	68.2	58.6	46.3	38.6	30.5	45.6	Do.
St. Louis	16.0	21.6	25.6	41.8	53.5	69.5	71.6					30.1		Do.
Sand Beach	16.3	21.4				64.4	68.0	67.0	59.1	46.8	39.4	31.8		Do.
Sault de Ste. Marie	8.5	10.8					62.1	59.2	52.6	40.8	31.0	23.2		Signal Service and State weather service.
Snowflake	14.2	15,9	17.0											State weather service.
Thornville	16.1	22.4	26.8	42.3	54.9	68.9	70.1	68.3	58.2	45.9	39.3	30.8	45.3	John S. Caulkins.
Traverse City (1)	16.0	15.0			46.0		68.0	67.0	56.0	46.0	37.0			S. E. Wait.
Traverse City (2)						65.7	68.2	64.5	56.2	44.5		30.2		State weather service.
Washington										44.9	38.0	29.8		Do.
West Branch	13.2	19.8	20.7	38.3	50.9	68.6	68.4	64.2	54.6		36.8	28.8		Do.
Williamstown	19.3	26.8	30.6	45.9	53.0	68.8	70,3		60.8	47.9	42.2	32.5		Do.
Ypsilanti							70.4	68.8	59.2	45.0	39.4	29.6		J. C. Bemiss.
Minnesota:														
Alexandria	−6.8	5.5	12.3	36.5	46.9	64.6								State weather service.
Argyle			[a]11.7	[a]34.5	[b]46.2	64.0	67.8		52.2	[d]40.0				Do.
Delano	−1.7		17.1		48.9	66.4	69.3		57.3	43.9		23.5		Do.
Duluth	2.1	12.1	15.5	35.0	42.2	53.8	64.9	63.8	55.6	43.6	34.2	24.7	37.3	Signal Service.
Farmington				40.4	52.4	67.8	74.3	66.6	57.0		34.2	24.8		State weather service.
Glenwood	−8.3	8.0	14.2	[a]38.8	49.6	65.5								Do.
Grand Meadow	−1.2		16.8	[d]36.8	46.4	67.4	73.4	64.2	52.6	43.0	32.2	25.5		Do.
Lake Winnibigoshish Dam		5.6	12.9		45.2		67.7	63.9	55.3	41.6	29.6	18.7		Do.
Leech Lake Dam		5.3	11.4		45.1		67.8	62.3	51.1	39.1	27.5	18.6		Do.
Le Sueur	[e]0.2	[d]14.7	[d]19.8	[d]43.8	[d]51.6	[d]71.5	[d]76.3	[d]69.8	[d]58.5	[d]45.9	[d]33.5	[e]24.4	42.4	L. B. Davis.
Mankato	0.6	14.0	19.6	42.5	49.9	67.4	72.8	66.5	58.1	45.8	35.8	26.4	41.6	State weather service.
Medford					49.7	66.2	71.3	64.0	54.7	42.5	31.9	23.8		Do.
Minneapolis	−1.7	11.5	17.8	40.2	49.8	67.4	72.0	65.5	57.0	44.1	33.0	23.6	40.3	William Cheney.
Moorhead	−8.6	4.4	12.3	37.9	47.8	64.2	69.0	63.2	56.6	43.0	29.2	20.2	38.0	Signal Service.
Morris	−5.6	7.1	13.8	39.0	48.9	66.4	70.3	65.2	58.6	42.4	30.1	21.1	39.0	State weather service.
Northfield	0.5	13.2	18.4	40.6	[d]48.5	70.2	72.6	66.2	57.4	44.6	34.3	25.9	41.0	Do.
Pine River Dam	−8.0	5.8	11.4	36.8	47.7	65.4	72.3	68.0	56.7	42.8	29.6	18.5	38.6	Do.
Pokegama Falls	−8.0	4.2	10.5	33.7	43.0		64.9	60.6	48.6	38.3	26.3	15.8		Do.
Red Wing	0.5	14.7	19.6	41.8	50.5	67.4	72.2	66.5	57.2	44.0	34.3	26.0	41.2	Do.
Rochester		7.3	17.9	42.5	[b]49.6						32.6			Do.
Rolling Green	−1.3	12.0	17.8	41.6	49.8	68.2	73.2	68.0	58.8	44.3	33.2	23.5	40.9	Do.
St. Cloud	−3.9[a]	11.6	17.0		[d]47.9					43.8	33.3			Do.
St. Paul	−0.9	12.4	18.2	40.5	49.8	67.0	73.1	67.4	58.0	45.2	36.0	24.8	41.1	Signal Service.
St. Vincent	−13.5	−0.1	7.8	34.8	46.5	62.8	66.0	60 8	54.6	41.2	25.0	15.4	35.7	Do.
Sherburne	−0.8	12.4	18.8											State weather service.
Snelling, Fort	−2.3	10.5	17.5	41.1	50.4	67.5	72.1	66.2	62.7	45.5	35.5	25.4	41.4	U. S. post hospital.
Spring Valley	−2.8	12.0	18.9	44.1	51.0									State weather service.
Tracy			17.3	41.4	47.5									Do.
Mississippi:														
Aberdeen				66.6	71.5	77.4	81.8	79.8	71.2	61.4				Signal Service.
Artonish	49.0	56.0	58.0	72.0	74.0	80.0	84.0	82.0	75.0	67.0	56.0	52.0	67.0	State weather service.
Batesville	39.0	46.0	51.0	65.5	70.0	75.6	81.6	79.2	70.7	60.2		47.0		Signal Service and state weather service.
Biloxi	53.1	57.2	58.4	69.7	73.7	79.0	82.4	79.5	74.7	68.8	59.4	[f]50.2	67.2	Dr. R. G. Hinsdale.
Brookhaven				70.0	73.0	78.8	83.4	81.2	74.9	65.4				Signal Service.

Table of monthly and annual mean temperature for 1888, *etc.*—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Mississippi—Continued.														
Columbus (1)	40.0	48.0	47.0	62.0	69.0	70.0	79.0	77.0	67.0					State weather service.
Columbus (2)				66.8	74.6	81.3	86.1	83.8	74.1	63.4				Signal Service.
Corinth		46.0	51.0	[c]66.2	[j]69.1	[c]74.6	[a]78.6	79.6	69.4	[e]59.0				Signal Service and State weather service.
Edwards	46.0		56.0	70.0	73.6	79.2	82.7	82.3	74.0	64.2				Do.
Greenville	42.0		53.0	[a]68.0	[b]72.0	77.0	[a]82.0	[b]81.0						State weather service.
Hazlehurst				68.6	72.6	79.0	82.2	81.2	74.7	66.0				Signal Service.
Hermanville	48.0	53.0	54.0		72.0									State weather service.
Hernando				65.0	69.8	75.4	81.0	78.8	70.0	60.8				Signal Service.
Holly Springs				65.6	70.0	75.8	81.1	[c]77.9	69.0	58.9				Do.
Jackson (1)					73.4	[c]78.6	81.8	[c]81.7	[j]74.8	[e]63.0				Do.
Jackson (2)		49.0	53.0	67.0	72.8	77.8	81.0	79.8		61.0				W. J. Brown, jr.
Lake				70.4	72.4	76.8	82.6	78.8	75.0	63.4				Signal Service.
Lamar	43.0	46.0	52.0	[f]67.0	73.0	[b]77.0	82.0			[d]62.0	56.0	45.0		State weather service.
Logtown						79.0	82.0	79.0	76.0	68.0	60.0	53.0		Do.
Macon				67.8	73.9	81.0	84.6	81.9	72.9	61.6				Signal Service.
Meridian				67.7	74.2	79.6	83.1	81.8	[f]75.3	64.2				Do.
Natchez				70.4	74.6	80.6	83.2	80.4	73.0	64.4				Do.
Okolona					72.8	79.2	84.0	81.6	71.7	61.4				Do.
Palo Alto	42.2	49.1	53.0	68.0	71.0	78.0	81.0	79.1	70.6	61.8	53.4	45.2	62.7	William H. Hill.
Pearlington						80.0	82.0	80.0	76.0	68.0	60.0	51.0		State weather service.
Port Gibson				69.4	72.3	78.8	82.1	81.4	73.8	64.7				Signal Service.
Starkville	48.0	49.0	52.0	67.0	72.0		83.0	81.0		63.0	54.0	45.0		State weather service.
University	39.5	46.5	50.5	66.4	70.2	76.5	81.6	80.2	70.8	60.6	52.0	44.0	61.6	Signal Service and State weather service.
Utica		56.0	55.0	69.0	71.0									State weather service.
Vicksburg	45.9	52.7	55.7	68.7	71.7	77.0	82.8	81.4	74.0	64.6	56.5	49.8	65.1	Signal Service.
Waynesborough				67.8	72.8	79.3	83.8	81.8	75.5	66.8				Do.
West Point	45.0	52.0	56.0	68.0	73.0	78.0	82.0	80.0						State weather service.
Missouri:														
Conception	13.5	26.1	32.6	53.8	56.8	69.6	77.5	70.5	63.3	50.9	37.6	32.1	48.7	Do.
Craig	11.1		30.9	55.8	59.6	72.1	80.9							Do.
Fayette	20.6	33.5	39.7	58.1	62.0				70.7	54.5	43.1	35.7		Prof. T. Berry Smith.
Fox Creek	23.7	31.6	42.1	57.8	62.4	72.9	78.0	72.6	63.5	55.1	41.9	36.8	53.2	State weather service.
Glasgow		30.9	38.0	57.3	61.3	71.9	78.1	73.0	64.8	52.7	40.8	31.5		Do.
Harrisonville	19.8	32.0	37.5	55.3	61.9	76.4	82.0		63.2		38.4	34.9		Do.
Ironton	22.0	28.5	37.9	53.6	56.0	65.1	70.4	65.8	56.4	47.0	37.3	38.6	48.2	Do.
Kansas City (1)							80.2	74.2	67.2	54.6	42.0	35.9		Signal Service.
Kansas City (2)	17.9	32.5	38.9	58.1	61.7	73.7	80.6	74.8	66.8	53.9	41.6	35.8	53.0	State weather service.
Kirksville	14.8	27.7	35.2	54.1	58.6	71.0	77.3	71.7	62.0		40.7	34.1		Do.

Lamar	25.3	36.7	41.9	58.7	62.5	71.8	79.2	74.9	66.7	55.0	43.0	38.0	54.5	Signal Service.
Lamonte	......	......	......	......	......	......	......	75.5	......	58.1	44.7	36.5	......	State weather service.
Louisiana	......	......	......	55.6	59.6	72.0	......	......	......	......	......	......	......	Do.
Maryville	10.4	26.7	32.0	51.2	55.7	......	......	......	......	......	33.9	32.2	......	Do.
Miami	18.1	30.9	38.0	56.8	61.1	73.5	79.5	76.2	64.8	......	......	......	......	Do.
Oregon	12.8	28.9	34.5	55.7	......	71.1	78.3	72.6	65.1	53.0	42.0	33.4	......	Do.
Ozark	31.5	39.6	......	64.0	66.3	75.7	......	77.9	68.2	54.0	45.0	37.8	......	Do.
Pierce City	29.3	39.8	46.0	60.8	64.8	73.7	80.4	76.0	67.1	55.4	42.4	38.4	56.2	J. J. Spilman.
Princeton	13.3	28.8	35.8	57.4	61.6	74.6	83.8	76.1	64.0	52.0	39.7	33.8	51.7	William Hirons.
St. Charles	22.6	31.2	39.4	59.2	63.8	73.6	78.9	......	65.1	53.7	45.8	35.1	......	State weather service.
St. Louis (1)	24.3	32.2	40.8	58.7	63.1	73.2	79.8	74.8	66.6	55.0	44.8	38.2	54.3	Signal Service.
St. Louis (2)	24.9	33.0	41.3	59.3	63.8	73.5	78.7	......	64.8	53.6	......	......	......	State weather service.
St. Louis (3)	25.9	33.6	43.1	59.6	63.9	74.0	80.2	75.1	67.3	55.0	45.0	37.9	55.0	Do.
Sedalia	23.8	36.2	43.1	61.5	66.9	76.2	82.8	76.6	......	57.2	45.9	37.0	......	Do.
Springfield (1)	27.8	44.0	......	59.9	63.6	71.5	......	74.9	65.8	......	......	......	......	Do.
Springfield (2)	24.5	37.0	43.1	55.6	62.1	70.9	77.5	......	62.8	51.0	40.8	36.0	......	Do.
Springfield (3)	27.5	37.0	41.5	59.0	62.1	70.9	79.0	74.2	66.0	54.2	43.2	38.2	54.4	Signal Service.
Steeleville	27.3	35.7	......	......	......	......	77.7	73.1	......	......	......	......	......	State weather service.
Warrensburgh	18.5	29.8	......	56.4	61.0	......	......	......	......	52.4	......	33.3	......	Do.
Warrenton	21.0	32.5	38.8	63.0	66.0	......	......	......	......	50.5	......	32.9	......	Prof. J. H. Frick.
Montana:														
Assiniboine, Fort (1)	0.5	20.7	18.6	44.6	50.5	59.2	68.6	65.5	61.0	46.0	29.2	26.0	40.9	Signal Service.
Assiniboine, Fort (2)	......	......	......	......	......	......	......	......	......	45.9	29.2	26.0	......	U. S. post hospital.
Custer, Fort (1)	[a]4.4	28.3	23.0	50.5	52.2	63.0	71.0	67.8	62.2	48.4	26.5	27.5	43.7	Signal Service.
Custer, Fort (2)	......	......	......	......	......	......	......	......	......	47.9	26.5	27.5	......	U. S. post hospital.
Helena	5.8	35.0	23.2	48.8	50.1	58.8	68.2	66.6	62.6	48.2	24.7	24.9	43.0	Signal Service.
Keogh, Fort	......	......	......	......	......	......	......	......	......	50.6	27.8	25.7	......	U. S. post hospital.
Maginnis, Fort (1)	11.5	28.8	20.2	43.3	44.6	54.2	64.4	62.6	59.6	44.6	34.6	35.2	42.0	Signal Service.
Maginnis, Fort (2)	......	......	......	......	......	......	......	......	......	46.8	35.5	36.1	......	U. S. post hospital.
Missoula, Fort	......	......	......	......	......	......	......	......	63.5	47.5	30.5	22.7	......	Do.
Poplar River	−10.0	9.4	9.5	38.6	50.0	62.0	68.2	64.7	59.6	44.2	27.0	21.2	37.0	Signal Service.
Shaw, Fort	9.8	31.6	23.6	49.5	53.1	59.8	70.1	67.6	61.2	48.2	35.1	34.8	45.4	U. S. post hospital.
Virginia City	25.9	32.0	24.7	46.0	48.2	57.0	64.0	63.0	59.5	54.0	27.4	25.9	44.0	Eugene Stark.
Nebraska:														
Brownville	10.2	29.2	40.1	......	......	......	......	......	......	......	......	......	......	State weather service.
Creighton	5.7	21.8	21.6	......	53.5	......	83.5	73.2	61.5	46.2	31.6	25.1	......	Do.
Crete	9.5	27.3	29.2	53.5	56.8	70.3	78.0	72.4	64.4	50.4	37.7	32.6	48.5	Signal Service.
Culbertson	......	......	......	56.5	60.5	76.7	83.4	74.8	69.0	53.6	38.8	33.9	......	G. D. Carrington.
David City	......	......	......	......	......	......	......	......	62.2	49.0	......	28.9	......	John R. Townsend.
De Soto	6.6	24.6	27.8	52.4	55.4	70.2	77.7	74.6	62.7	49.4	37.0	30.2	47.4	Charles Seltz.
Falls City	10.8	28.2	33.0	55.7	59.3	72.4	80.0	73.1	65.1	51.9	37.0	31.3	49.8	A. B. Newkirk.
Franklin	13.8	30.8	......	53.4	57.4	......	......	......	......	......	......	......	......	State weather service.
Fremont (1)	8.9	24.8	27.8	52.0	54.9	70.0	76.8	70.9	62.2	47.9	35.7	29.4	46.8	Isaac E. Heaton.
Fremont (2)	11.0	23.5	27.8	52.0	......	......	......	......	......	......	......	......	......	Rev. L. F. Berry.
Genoa	6.9	25.5	24.6	51.4	54.9	69.8	76.7	70.5	[b]64.0	48.4	35.4	29.7	46.5	George S. Truman.
Hay Springs	8.9	27.9	25.3	47.7	48.9	67.0	71.2	64.8	59.7	44.0	30.1	[a]28.2	43.6	William Waterman.
Kimball	18.8	34.4	30.0	50.6	52.6	67.8	74.0	66.2	61.2	48.2	34.8	33.1	47.6	William G. Barton.
Lincoln	6.1	26.5	31.4	53.8	57.3	70.5	78.6	71.3	64.0	50.9	38.6	33.4	48.5	University of Nebraska.
Minden	12.0	31.2	27.4	54.3	57.8	70.6	......	72.7	......	51.2	37.2	32.1	......	State weather service.
Nebraska City	8.4	26.1	29.9	52.7	56.9	70.8	78.6	71.0	62.8	50.1	36.4	29.9	47.8	Do.
Niobrara, Fort	8.2	27.4	25.6	51.9	52.6	70.8	76.0	69.4	59.1	48.6	28.7	21.3	49.7	U. S. Post Hospital.
North Loup	8.4	26.6	......	52.1	53.8	......	75.5	72.8	58.9	45.0	31.2	26.6	......	State weather service.

Table of monthly and annual mean temperature for 1888, *etc.*—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Nebraska—Continued.														
North Platte	12.7	31.5	26.9	52.1	54.0	69.3	75.5	69.2	63.6	48.6	36.4	30.8	47.6	Signal Service.
Omaha	8.0	25.9	28.8	52.5	55.9	70.0	79.2	72.4	64.0	51.2	39.7	32.3	48.3	Do.
Palmer	5.0	24.0	21.0	49.3	52.0	74.2	80.2	72.8	61.6	42.2	31.8	28.9	45.3	State weather service.
Robinson, Fort	16.8	31.6	23.1	52.8	51.9	......	......	64.7	61.2	48.4	36.7	35.3	......	U. S. post hospital.
Sargent	......	......	......	49.8	51.7	69.9	75.0	......	......	45.3	33.0	26.7	......	State weather service.
Sidney, Fort	......	......	......	......	......	......	75.7	......	61.8	47.9	29.2	31.3	......	U. S. post hospital.
Syracuse	10.1	27.1	31.2	54.3	59.2	72.4	80.1	73.4	65.3	51.1	38.6	31.8	49.6	P. W. Risser.
Tecumseh	11.2	28.3	31.8	53.0	56.9	72.3	81.4	72.6	63.4	46.0	40.6	33.8	49.3	W. L. Dunlap.
Valentine	8.7	27.7	24.8	50.0	50.9	67.8	74.4	67.6	60.9	......	40.6	34.2	......	Signal Service.
Weeping Water	7.6	25.5	28.5	49.4	55.8	67.1	77.3	71.8	......	46.8	36.3	30.8	......	G. Treat.
West Hill	5.4	......	......	......	......	......	77.8	70.6	......	48.9	33.7	28.6	......	State weather service.
Nevada:														
Austin	......	34.3	......	51.8	......	59.6	70.7	69.6	79.1	55.5	39.3	......	......	Do.
Battle Mountain	......	37.6	39.2	51.4	57.3	64.1	75.8	76.4	65.2	49.7	35.1	32.9	......	Pacific Railway system.
Beowawe	......	36.5	39.5	56.0	60.7	70.6	80.1	......	74.2	53.3	......	33.6	......	Do.
Browns	......	42.3	47.9	61.9	65.8	71.9	81.8	77.5	......	56.2	44.7	38.8	......	Do.
Carlin	10.6	29.8	38.0	53.6	61.3	68.2	79.7	72.5	69.7	51.2	34.5	23.5	49.4	Do.
Carson City (1)	27.6	40.3	41.9	53.8	56.1	60.8	68.1	67.1	65.6	52.4	40.0	38.5	51.0	Signal Service.
Carson City (2)	26.7	38.6	40.6	53.3	56.7	61.0	70.6	69.4	65.1	51.7	38.4	36.6	50.7	Prof. Charles W. Friend.
Dayton	......	42.4	43.6	57.1	58.0	......	......	......	68.1	54.5	41.8	37.0	......	State weather service.
El Dorado	......	......	......	......	......	......	92.7	92.4	91.4	76.2	60.8	53.6	......	Do.
Elko	15.3	35.9	38.9	58.5	65.4	71.5	81.8	......	70.2	54.6	38.6	31.6	......	Pacific Railway system.
Ely	......	33.6	33.2	49.1	52.4	64.5	69.4	67.1	63.3	......	35.7	......	......	State weather service.
Eureka	......	......	......	49.7	54.8	67.4	77.4	77.2	72.7	53.4	39.2	36.0	......	Do.
Genoa	......	40.5	40.4	......	......	60.7	......	70.0	66.8	55.0	40.2	37.8	......	Do.
Golconda	......	43.4	49.8	......	69.5	72.0	......	......	......	54.6	51.7	42.6	......	Pacific Railway system.
Hawthorne	30.0	44.6	45.7	56.1	65.2	73.3	79.0	79.3	73.2	57.5	43.7	42.5	57.5	Do.
Hot Springs	......	35.2	40.2	53.9	56.2	66.8	78.7	......	71.8	57.3	41.6	31.2	......	Do.
Humboldt	......	40.2	......	......	......	57.3	......	......	61.7	51.5	40.4	35.6	......	Do.
Lovelocks	......	42.1	......	61.9	66.7	71.6	79.3	......	......	......	......	......	......	State weather service.
McDermit, Fort	19.7	37.0	37.9	54.2	57.0	61.7	74.1	72.3	70.4	52.7	39.2	35.6	51.0	U. S. post hospital.
Mill City	......	41.4	41.6	54.8	59.2	68.6	79.0	79.3	74.3	53.5	42.6	26.3	......	State weather service.
Palisade	......	34.6	......	56.5	69.5	......	......	80.1	71.8	48.4	36.3	31.2	......	Pacific Railway system.
Pioche	......	37.0	38.5	54.8	57.4	......	69.7	68.6	72.4	51.6	......	30.4	......	State weather service.
Pyramid	......	......	......	......	59.2	62.0	75.3	......	70.2	......	......	......	......	Do.
Reno (1)	......	48.8	43.6	54.0	56.6	60.0	78.5	......	66.5	53.8	39.8	40.8	......	Pacific Railway system.
Reno (2)	......	42.7	42.4	55.2	58.9	62.8	68.6	......	66.5	......	40.2	......	......	State weather service.
Rioville	......	......	......	......	......	......	99.7	101.1	96.3	80.5	61.9	50.9	......	Do.
Rye	......	......	42.0	57.2	64.3	......	......	......	......	......	......	......	......	Do.

Stillwater	.....	.....	.....	.....	.....	67.0	71.9	71.0	.....	.....	.....	.....	.....	Do.
Tecoma	14.8	38.0	40.0	57.4	62.3	71.0	80.7	78.8	72.9	54.3	40.0	32.8	53.5	Pacific Railway system.
Toano	13.0	33.6	34.5	56.4	59.6	67.5	78.9	.....	70.2	51.0	84.7	29.4	.....	Do.
Tuscarora	.....	.....	.....	.....	.....	.....	.....	73.6	65.4	46.4	33.8	30.1	.....	State weather service.
Verdi	.....	35.7	38.6	52.3	55.4	60.1	70.7	68.1	66.5	.....	.....	38.0	.....	Do.
Wadsworth (1)	23.8	42.5	42.3	57.7	62.0	68.4	79.0	.....	.....	.....	38.2	33.7	.....	Pacific Railway system.
Wadsworth (2)	.....	44.3	40.2	56.4	61.1	67.3	78.7	.....	.....	.....	.....	.....	.....	D. Washeim.
Wellington	.....	.....	.....	48.4	49.4	55.3	64.6	67.3	.....	.....	36.7	33.4	.....	State weather service.
Wells	—2.1	27.2	33.3	62.9	69.0	.....	69.4	.....	66.1	48.2	36.6	30.6	.....	Pacific Railway system.
Winnemucca (1)	18.7	38.9	39.1	54.6	56.8	62.8	71.6	69.6	66.6	50.6	39.2	35.1	50.3	Signal Service.
Winnemucca (2)	21.1	.....	40.0	54.6	58.3	66.7	76.1	71.0	.....	51.3	51.1	38.5	.....	Pacific Railway system.
Winnemucca (3)	.....	37.3	39.2	53.3	57.4	66.7	71.4	67.3	50.9	50.8	.....	.....	.....	State weather service.
New Hampshire:														
Berlin Falls	.....	14.5	21.0	31.8	48.3	60.6	61.1	60.0	51.4	39.9	32.4	22.6	.....	Appalachian Mountain Club.
Berlin Mills	7.8	14.5	20.8	33.9	50.0	62.8	62.3	64.8	54.8	40.4	36.1	23.6	39.8	Q. A. Bridges.
Chesterfield	.....	.....	.....	37.7	.....	.....	.....	.....	57.7	.....	33.9	23.8	.....	New England Meteorological Society.
Concord	14.8	23.0	28.8	41.1	54.2	66.0	66.7	66.8	57.0	43.8	38.6	29.9	44.2	W. L. Foster.
Hanover	6.8	17.2	24.2	37.0	53.4	64.7	66.8	65.0	56.0	40.5	35.1	26.2	41.1	New England Meteorological Society.
Manchester (1)	14.2	23.6	29.1	40.4	53.5	66.7	67.2	67.5	57.4	44.0	89.2	30.2	44.4	Signal Service.
Manchester (2)	14.1	23.0	28.6	40.1	53.9	66.6	68.2	67.5	57.2	43.7	38.9	30.5	44.4	New England Meteorological Society.
Manchester (3)	13.6	22.0	28.0	39.4	.....	.....	.....	.....	.....	43.1	38.1	29.3	.....	Do.
Mount Washington	.....	.....	.....	.....	.....	.....	44.8	44.9	37.4	.....	.....	.....	.....	Signal Service.
Nashua	14.4	23.8	29.4	40.5	53.1	66.3	67.9	68.1	56.2	44.0	39.5	31.3	44.5	Charles H. Webster.
North Conway	10.2	18.3	27.3	37.4	51.7	64.3	65.4	64.8	55.5	41.6	.....	27.0	.....	New England Meteorological Society.
Plymouth	8.4	16.8	24.4	36.5	51.7	64.6	65.4	65.0	59.3	40.2	33.1	25.2	40.9	Do.
Shaker Village	.....	.....	.....	.....	.....	.....	.....	.....	.....	41.0	37.8	27.0	.....	Nicholas A. Briggs.
Shelburne	8.6	18.6	25.7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	New England Meteorological Society.
Stratford	8.4	19.4	26.0	37.5	53.2	66.4	67.5	66.2	56.8	40.8	34.6	26.2	41.9	Do.
Walpole	7.4	18.6	22.9	37.0	50.7	63.0	65.0	64.0	54.2	88.5	33.2	24.1	39.9	Do.
West Milan	5.6	16.0	22.4	32.8	48.6	62.2	62.2	61.8	54.0	88.2	32.3	23.4	88.2	Do.
New Jersey:														
Atlantic City	28.3	33.2	32.8	45.9	55.1	66.6	70.2	72.2	60.2	51.2	47.2	36.2	49.9	Signal Service.
Beverly	26.1	31.7	33.9	49.0	60.0	71.1	71.7	72.9	63.8	49.7	45.8	35.9	51.0	Charles F. Richardson.
Billingsport L. H	27.3	32.7	34.9	49.4	61.7	73.8	74.8	76.6	66.1	51.8	47.1	36.1	52.7	State weather service.
Bordentown	25.8	31.6	31.6	46.7	58.6	67.2	.....	.....	.....	.....	.....	.....	.....	Do.
Bridgeton	.....	.....	.....	51.3	63.0	75.0	73.9	75.8	66.1	53.4	49.2	.....	.....	Do.
Clayton	27.6	33.3	37.7	48.7	57.6	70.8	71.6	72.1	63.1	49.4	46.4	36.1	51.2	William T. Wilson.
Egg Harbor City	26.5	32.5	34.8	46.8	57.6	67.3	69.4	71.8	62.8	59.0	45.9	34.8	50.7	H. Y. Postma.
Freehold	26.2	31.3	32.0	46.9	58.0	.....	70.1	71.0	62.6	48.6	45.4	34.2	.....	State weather service.
Gillette	23.7	28.1	30.7	45.7	57.8	69.7	69.2	72.3	62.6	47.0	43.9	34.6	48.7	Do.
Hanover	22.0	27.1	30.8	44.8	57.2	68.0	67.7	68.6	59.7	44.0	40.8	31.6	46.9	Do.
Highland Park	.....	.....	.....	.....	.....	69.9	69.9	71.5	62.0	47.8	44.1	33.8	.....	Do.
Imlaystown	25.5	31.2	32.0	47.7	58.5	69.8	70.0	71.7	62.6	48.2	45.3	34.4	49.7	Do.
Lambertville	24.4	29.4	32.2	47.2	58.8	70.2	70.5	71.3	63.6	.....	44.5	35.4	.....	Do.
Locktown	23.1	28.4	31.6	46.9	55.7	87.7	70.7	71.9	63.5	.....	43.6	33.7	.....	Do
Moorestown	25.4	32.2	32.9	48.0	59.0	70.3	70.6	72.2	63.0	48.6	45.3	34.3	50.2	Thomas J. Beans.

Table of monthly and annual mean temperature for 1888, *etc.*—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
New Jersey—Continued.														
Newark	24.9	31.0	32.7	47.9	59.7	72.9	72.7	73.0	64.0	50.0	45.8	35.0	50.8	State weather service.
New Brunswick (1)	24.6	29.0	32.0	47.7	58.3	70.2	70.0	72.4	63.3	48.8	45.2	34.4	49.7	Do.
New Brunswick (2)	23.8	28.8	31.9	....	....	....	69.9	71.8	....	....	....	33.8	....	Do.
Ocean City	29.2	34.0	34.1	46.5	55.5	69.4	72.3	74.8	65.6	54.3	48.1	36.2	51.7	Do.
Oceanic	27.8	32.6	34.0	50.9	57.1	72.4	74.4	75,4	64.6	51.2	48.7	37.4	52.2	Do.
Paterson	23.7	29.5	30.8	46.8	57.7	70.2	....	[s]70.9	61.9	49.3	45.2	36.1	....	Do.
Princeton	24.3	30.0	32.1	49.5	59.3	70.9	....	....	....	....	....	....	....	Do.
Rancocas	24.0	29.5	31.0	45.5	55.5	67.0	....	....	....	....	44.5	....	....	Do.
Readington	27.9	33.9	35.8	49.2	62.1	75.0	76.5	76.8	67.1	50.5	48.9	38.2	53.5	John Fleming.
Somerville	24.7	29.0	31.8	47.0	58.3	70.9	69.9	71.5	61.6	47.2	44.6	34.1	49.2	State weather service.
South Orange	24.2	29.4	30.6	46.2	57.4	69.1	69.4	70.1	61.2	47.6	43.8	32.4	48.4	Dr. W. J. Chandler.
Tenafly	22.7	28.4	30.2	46.2	57.2	69.8	70.2	70.8	59.3	47.0	43.7	32.3	48.2	State weather service.
Tom's River	27.1	31.8	32.5	46.7	49.2	69.5	70.2	71.7	63.0	49.2	46.6	34.4	49.8	Do.
Trenton	....	....	37.0	53.0	59.0	75.0	76.0	77.0	68.0	....	58.0	39.0	....	Do.
Union	23.1	28.2	30.4	46.0	57.2	69.5	69.3	70.4	61.3	47.1	43.4	32.5	48.2	Do.
Vineland	30.4	37.0	41.0	51.7	60.0	76.4	74.2	75.4	66.5	51.2	47.6	36.1	52.8	Dr. O. H. Adams.
New Mexico:														
Bayard, Fort	41.0	43.5	45.0	59.2	64.1	76.2	75.0	72.2	71.8	63.9	50.0	45.8	58.9	U. S. post hospital.
Coolidge	....	....	....	....	....	....	....	67.0	62.4	49.5	....	....	....	B. S. Mullin.
Gallinas Spring	39.6	[a]45.4	46.8	58.7	64.0	74.1	72.2	73.0	67.5	56.1	[a]47.0	41.6	57.2	J. E. Whitmore.
Las Vegas	34.9	37.3	39.7	53.8	56.6	69.2	70.9	68.4	58.1	49.9	38.6	35.2	51.0	F. W. Chatfield.
Lava	36.4	42.0	47.8	59.0	66.6	80.4	81.6	77.9	70.2	57.0	42.9	38.4	....	Signal Service.
Santa Fé	30.3	35.5	37.4	49.9	53.4	67.1	70.2	65.8	63.0	51.0	37.6	33.3	49.5	Do.
Selden, Fort	42.1	47.2	53.9	66.2	71.9	83.2	82.8	80.3	72.9	63.3	49.7	44.4	63.2	U. S. post hospital.
Stanton, Fort	36.3	38.0	38.9	52.8	56.6	67.9	68.7	66.1	59.6	51.8	40.0	35.2	51.0	Signal Service.
Union, Fort	32.4	37.4	38.0	50.8	55.5	65.5	72.8	67.2	60.1	46.8	36.6	32.8	49.7	U. S. post hospital.
Wingate, Fort	26.2	33.7	36.8	49.3	54.3	67.0	68.1	66.6	61.8	50.6	38.1	31.9	48.7	Do.
New York:														
Albany (1)	15.2	23.3	26.3	43.6	57.7	69.4	70.8	71.2	61.2	45.6	40.6	29.8	46.2	Signal Service.
Albany (2)	14.1	21.8	25.6	43.4	....	....	....	....	....	....	....	....	....	C. B. Tillinghast.
Ardenia	21.0	27.8	30.0	44.2	56.8	69.2	69.2	70.6	61.2	45.8	43.4	33.6	47.7	Richard B. Arden.
Auburn	19.6	25.9	27.2	43.2	55.4	64.3	70.1	64.7	58.3	46.2	41.3	33.0	45.8	Geo. Casey.
Boyd's Corners	19.1	25.2	....	45.2	59.3	71.6	71.5	71.6	61.8	46.9	42.4	[j]32.0	....	Thomas Manning.
Brooklyn	26.1	32.0	32.6	47.5	58.8	73.8	....	72.2	....	....	....	37.8	....	Prof. W. C. Peckham.
Buffalo	18.2	23.8	25.0	38.8	53.2	64.9	67.9	67.8	59.0	45.1	40.6	30.9	44.6	Signal Service.
Carmel	19.5	23.8	28.0	44.0	56.8	67.8	68.7	69.6	60.2	45.6	41.1	29.8	46.2	Thomas Manning.
Columbus, Fort	25.3	30.4	31.5	46.5	56.6	70.1	71.4	73.2	64.2	50.3	45.7	35.8	50.0	U. S. post hospital.
Cooperstown	13.8	20.5	22.3	37.7	53.3	64.0	66.0	66.0	56.0	41.5	37.7	27.6	42.2	G. Pomeroy Keese.
David's Island	....	....	....	....	....	....	....	....	....	54.8	44.4	[m]37.3	....	U. S. post hospital.
Eden	....	....	30.0	44.2	57.2	69.2	71.2	66.5	58.4	44.6	40.9	32.1	....	W. P. Hunt.

Factoryville	18.5	22.0	25.9	42.4	56.5	67.0	67.4	67.2	57.6	44.2	39.1	28.8	44.7	F. P. Yates.
Friendship	18.7	25.2	27.0	41.8	55.2	64.2	64.9	65.4	52.3	37.8	38.2	27.8	43.2	Jesse D. Rogers.
Geneva	......	......	......	39.2	53.1	64.6	65.6	67.2	58.0	43.3	40.6	31.2	......	Mrs. N. S. Yates.
Hamilton, Fort	......	......	......	......	......	......	......	......	63.2	49.2	45.1	35.5	......	U. S. post hospital.
Humphrey	15.6	23.2	24.0	39.3	53.2	65.0	69.1	66.2	57.1	43.6	38.2	27.3	43.5	Chas. E. Whitney.
Ithaca	18.7	25.0	26.3	41.8	55.6	67.7	68.4	68.2	57.8	44.0	39.6	30.2	45.2	Engineering Department, Cornell University.
Le Roy	16.3	23.8	25.4	40.6	54.7	67.0	......	......	56.3	42.7	40.4	28.6	......	Prof. F. M. Comstock.
Lyons	......	......	......	......	[b]57.4	64.7	68.0	66.7	57.9	44.7	40.0	31.0	......	Dr. M. A. Veeder.
Madison Barracks	10.4	17.7	21.9	38.4	53.1	66.3	68.4	67.6	57.3	43.0	37.9	27.1	42.6	U. S. post hospital.
Middleburgh	......	......	......	......	......	......	......	67.6	58.4	43.7	41.0	[a]30.5	......	F. X. Straub.
New York (1)	25.9	31.6	32.0	47.9	57.9	71.4	72.6	74.8	66.2	51.2	46.8	36.0	51.2	Signal Service.
New York (2)	23.0	29.3	30.0	46.0	58.0	70.8	70.7	72.6	62.8	48.6	45.4	34.7	49.3	Meteorological Observatory, Central Park.
Niagara, Fort	20.0	25.6	25.0	39.4	50.2	65.7	67.5	69.4	61.3	47.5	42.5	83.4	45.6	U. S. post hospital.
North Volney	14.1	......	23.1	38.6	53.7	......	......	67.3	56.2	43.6	38.0	......	......	J. M. Patrick.
Oswego	15.4	22.3	23.6	38.1	52.0	63.7	65.8	66.9	57.8	44.1	39.4	29.6	43.2	Signal Service.
Palermo	11.6	19.8	22.6	38.2	52.2	64.9	67.0	65.4	57.1	43.9	37.6	29.1	42.4	E. B. Bartlett.
Palmyra	18.5	25.6	26.5	43.2	58.2	70.2	70.1	69.7	59.1	45.1	40.4	31.6	46.5	L. D. Cummings.
Plattsburgh Barracks	10.5	16.8	23.8	37.5	55.4	66.4	70.0	64.3	53.8	42.1	36.4	26.7	42.0	U. S. post hospital.
Rochester	17.2	24.2	24.7	40.5	54.1	66.6	67.8	67.6	58.0	44.2	40.4	80.0	44.6	Signal Service.
Rose	......	......	25.1	40.0	53.8	65.3	65.1	[b]65.0	[j]53.5	42.2	87.6	29.0	......	George Smart.
Savona	......	......	......	......	......	......	66.9	66.0	53.7	43.9	38.5	28.8	......	W. S. Collier, M. D.
Setauket	24.9	29.7	30.6	44.7	55.3	67.5	69.2	71.0	62.5	50.0	45.8	35.4	48.9	S. B. Strong.
Utica	12.4	21.4	23.3	37.7	55.5	65.0	65.9	64.3	56.7	41.3	37.6	29.6	42.6	Thomas Birt.
Waddington	......	......	......	......	......	......	......	......	55.5	39.8	31.8	24.7	......	Joseph Graves.
Wadsworth, Fort	......	......	......	......	......	......	......	......	[d]63.5	48.7	44.9	34.2	......	U. S. post hospital.
West Point	17.8	23.1	28.4	46.0	57.2	69.8	72.0	71.4	61.4	44.0	41.2	30.8	46.9	Do.
White Plains	22.9	28.8	31.2	47.4	58.0	70.8	69.9	71.8	62.2	48.9	44.8	34.6	49.2	Prof. O. R. Willis.
North Carolina:														
Chapel Hill	39.4	47.2	47.3	60.4	66.9	77.6	......	......	67.7	56.1	51.6	41.2	......	Prof. J. W. Gore.
Charlotte	42.0	46.1	49.3	63.2	67.3	77.0	79.0	79.0	69.0	57.3	52.0	42.8	60.3	Signal Service.
Hatteras	44.7	46.3	48.0	57.3	66.7	73.1	75.0	77.9	73.3	61.2	57.4	46.2	60.6	Do.
Hot Springs	45.0	47.8	46.1	59.4	63.8	72.8	74.8	74.1	64.3	53.7	49.6	89.5	57.5	W. F. Ross, M. D.
Kitty Hawk	44.6	46.1	48.5	57.7	68.6	76.8	76.6	83.7	71.6	60.2	57.9	46.5	61.6	Signal Service.
Lenoir	37.5	43.5	45.2	58.0	63.4	72.4	77.2	......	68.8	52.3	48.6	37.1	......	Dr. R. L. Beall.
Monroe	41.8	......	50.4	62.0	......	77.3	78.4	77.7	......	56.7	51.5	41.6	......	State weather service.
Mount Pleasant	39.6	......	46.8	60.2	......	74.0	......	76.2	......	54.8	50.1	39.8	......	Do.
Raleigh (1)	40.0	44.1	46.8	59.1	66.6	76.0	78.4	78.1	68.6	55.8	51.0	41.6	58.8	Signal Service.
Raleigh (2)	42.0	47.0	49.0	63.0	68.0	78.0	79.0	81.0	71.0	58.0	53.0	44.0	61.1	T. C. Harris.
Salisbury	39.8	......	47.8	62.7	......	78.6	80.0	79.0	......	......	51.6	41.3	......	State weather service.
Southport	46.4	49.6	51.4	61.6	74.4	74.8	77.9	80.2	74.2	62.9	57.3	43.4	62.8	Signal Service.
Statesville	88.9	47.0	46.6	59.6	64.0	74.8	76.8	76.1	65.6	53.7	49.0	38.6	57.6	W. A. Eliason.
Tarborough	......	......	49.4	59.9	68.1	75.8	77.3	79.5	......	......	......	......	......	E. V. Zoeller.
Weldon	37.7	43.1	45.7	56.5	66.8	75.4	76.6	79.0	69.0	55.2	51.2	40.2	58.0	T. A. Clark.
Wilmington	46.5	49.6	51.4	61.7	69.9	75.8	77.4	78.2	72.8	62.6	57.0	46.8	62.5	Signal Service.
Ohio:														
Akron	23.1	29.8	31.5	45.9	57.4	68.5	70.2	68.5	58.2	45.7	41.3	31.7	47.6	State weather service.
Athens	......	......	......	52.1	61.6	71.3	72.4	70.9	60.7	48.8	43.5	34.8	......	Do.
Bangorville	21.5	28.3	31.7	46.8	56.4	67.7	70.1	67.7	58.5	45.0	41.0	30.6	47.1	Do.
Bellevue	......	......	83.1	46.5	56.1	68.1	70.2	70.0	59.2	46.1	41.5	32.4	......	William Sheffield.
Canton	23.0	29.2	32.6	47.0	58.6	68.9	70.1	[b]69.5	......	......	......	......	......	State weather service.

Table of monthly and annual mean temperature for 1888, *etc.*—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Ohio—Continued.														
Celina	22.8	29.3	34.7	50.6	58.9	71.4	73.0	70.7	61.6	48.3	43.6	35.2	50.0	State weather service.
Cincinnati	29.3	34.9	39.0	54.7	62.9	74.2	77.1	74.2	64.8	52.0	46.4	37.0	53.9	Signal Service.
Clarksville	27.0	32.5	36.6	52.7	61.0	70.2	73.9	70.6	61.7	49.3	43.9	34.5	51.2	State weather service.
Cleveland (1)	22.3	27.8	30.6	44.5	56.2	68.0	70.6	70.6	60.6	48.0	43.4	33.8	48.0	Signal Service.
Cleveland (2)	23.2	28.5	31.6	45.5	56.8	68.2	70.1	69.6	59.6	48.3	43.4	34.7	48.3	G. A. Hyde.
College Hill	25.9	32.4	30.4	55.9	59.9	75.7	78.0	76.9	63.7	51.7	46.3	35.9	52.7	John W. Hammitt.
Collinwood	......	......	......	......	......	66.6	73.2	71.8	......	49.0	43.1	34.7	......	Philip H. Cobb and Wm. Smeed.
Columbus	26.6	32.7	35.3	51.0	60.4	71.6	73.2	71.4	61.3	48.7	44.1	34.2	50.9	Signal Service.
Dayton	26.5	32.4	36.8	52.9	62.2	74.3	76.4	72.9	62.5	49.2	44.0	35.0	52.1	State weather service.
Demos	......	......	......	......	......	......	......	70.7	58.3	46.8	42.7	32.6	......	B. B. Ault.
Elyria	20.6	27.0	31.6	46.2	56.4	66.8	71.4	70.5	60.4	48.0	43.6	34.4	48.1	Charles W. Goodspeed.
Fostoria	......	......	......	......	......	......	......	......	......	48.3	43.3	32.1	......	State weather service.
Garrettsville	20.1	25.7	29.1	43.8	54.5	64.8	66.4	65.4	55.5	44.0	39.4	30.7	45.0	S. M. Luther.
Georgetown	28.9	34.4	38.0	50.2	62.8	73.2	[b]75.6	72.9	63.2	49.9	44.7	35.0	52.4	State weather service.
Gracey	......	......	......	......	......	......	......	[i]67.4	58.8	47.2	42.1	32.2	......	H. M. Scott.
Greenville	23.0	29.2	34.0	50.3	58.5	70.7	72.2	69.1	59.7	46.0	42.3	33.1	49.0	State weather service.
Hanging Rock	30.6	35.3	37.5	51.7	60.9	69.4	71.4	71.2	60.3	48.6	44.5	33.4	51.2	Do.
Hiram	20.4	27.1	29.3	44.6	56.5	67.1	71.5	[d]67.8	58.5	45.3	40.9	31.6	46.7	Do.
Jacksonsborough	23.6	28.8	33.9	51.8	59.8	72.7	75.3	72.3	62.3	48.9	42.5	33.4	50.4	Dr. J. B. Owsley.
Jefferson	19.3	25.3	27.4	42.6	54.5	65.1	66.6	66.1	56.2	44.9	40.7	30.7	45.0	State weather service.
Logan	27.4	32.7	36.7	51.2	60.9	70.7	71.7	69.9	60.5	48.2	43.5	33.8	50.6	Do.
Lordstown	22.6	27.4	30.5	45.8	57.6	67.5	68.4	67.7	57.7	46.7	41.8	33.0	37.2	W. S. Dean.
McConnellville	28.8	34.2	36.0	50.3	62.7	69.2	71.4	70.0	61.5	50.3	43.3	32.6	50.9	State weather service.
Marietta	[c]30.0	[e]35.4	38.0	53.0	62.6	71.9	[d]73.1	71.6	61.4	49.6	44.4	34.3	52.1	Do.
Napoleon	20.7	27.6	[g]30.3	48.4	60.2	70.3	75.3	72.1	60.4	57.2	43.6	35.5	50.1	Dr. T. C. Hunter.
New Alexandria	25.1	31.7	33.9	49.0	59.6	70.2	70.7	69.5	59.2	47.3	42.6	32.8	49.3	State weather service.
New Athens	23.8	30.5	34.8	47.7	59.9	67.1	65.4	68.8	58.5	46.0	41.7	31.8	48.0	T. M. Sewell.
New Comerstown	25.2	30.3	34.1	48.2	59.7	70.1	71.3	69.2	58.7	46.3	41.2	31.5	48.8	State weather service.
North Lewisburgh	24.1	31.2	35.3	51.9	60.5	73.4	75.3	72.5	62.8	49.2	43.2	33.3	51.1	H. D. Gowey.
Oberlin	21.2	27.4	30.9	45.5	56.1	67.9	70.0	69.2	58.0	46.7	41.5	32.1	47.2	State weather service.
Ohio State University	24.6	31.2	35.1	46.3	60.1	71.1	72.8	70.9	59.7	47.4	42.6	33.0	49.6	Do.
Paulding	......	......	30.8	47.1	56.5	70.0	[a]71.7	69.4	......	......	......	......	......	Do.
Pomeroy	[a]31.6	37.9	42.8	57.3	65.0	76.1	78.0	77.4	64.9	[k]52.2	47.8	36.8	55.6	Do.
Portsmouth	31.5	36.5	39.7	53.7	61.7	71.6	73.4	72.3	62.4	51.1	46.6	36.4	53.1	Dr. D. B. Cotton.
Quaker City	26.0	32.3	35.5	50.4	60.4	70.9	72.0	70.4	......	......	[j]39.2	34.5	......	State weather service.
Sandusky	21.2	26.9	30.8	45.4	55.6	68.8	72.4	71.6	61.6	47.9	43.4	33.1	48.2	Signal Service.
Savannah (Ruggles)	22.2	26.7	31.3	45.8	55.5	65.5	68.8	67.8	55.1	46.1	41.8	32.9	46.6	Peter Bowman.
Sidney	23.8	30.0	34.8	51.0	59.4	74.0	74.9	72.3	62.0	47.8	43.1	34.4	50.6	Signal Service.
Tiffin	22.5	28.2	33.3	47.5	57.3	71.2	71.0	69.5	60.0	47.3	42.7	33.2	48.6	Rev. T. H. Sonedecker.
Toledo	19.5	25.8	30.1	45.6	55.1	68.8	72.2	70.2	59.9	47.6	42.7	32.6	47.5	Signal Service.

Upper Sandusky	22.5	29.4	33.5	49.7	59.0	70.1	73.0	70.3	60.7	47.4	43.2	33.3	49.3	State weather service.
Wapakoneta	21.6	27.3			59.1	72.5	73.4		[a]60.3	47.4	42.3	33.2		Do.
Washington	[h]27.6	[i]30.6			[e]60.2	71.3	73.1							Do.
Wauseon	17.5	24.7	29.7	46.8	55.2	69.8	71.6	69.9	59.2	46.0	40.1	31.0	46.7	Thomas Mikesell.
Waverly	28.8	33.1	37.0	[j]54.8				[f]68.6						State weather service.
Westerville	[c]23.6	30.2	34.0	49.3	59.1	69.4	70.8	[i]67.6	58.6	46.8	42.2	32.3	49.7	Prof. John Haywood.
West Milton	26.2	32.0	37.0	56.0	62.0	71.0	76.4	74.0	60.1	50.6	46.8	30.6	51.9	Luke S. Motte.
Wooster	[f]22.9	28.4	31.7	46.3	57.7	66.0	70.1	[a]67.8	57.1	44.9	40.8	31.4	47.1	State weather service.
Yellow Springs	25.1	31.1	35.2	50.9	57.3	70.7	72.4	70.0	60.6	47.3	42.9	33.5	49.8	C. W. Rice.
Youngstown	23.4	30.3	33.0	47.5	56.2	70.9	83.4	70.0	60.9	48.9	43.2	33.3	50.1	State weather service.
Oregon:														
Albany	33.9	44.3	46.0	55.4	60.2	61.0	65.8	68.7	64.5	54.9	45.2	43.9	53.6	Jno. Briggs.
Ashland	32.7	44.2	45.4	55.6	60.9	59.4	68.6	70.6	70.8	57.0	46.0	45.2	54.7	Signal Service.
Astoria	34.7	42.8	45.3	50.6	56.4	58.9	62.6	63.0	65.4	55.8	46.6	45.7	52.3	Do.
Bandon	39.6	45.2	45.3	49.6	53.5	59.3	59.5	59.1	57.2	54.1	51.5	52.5	52.2	George Bennett.
Eola	31.8	45.6	43.8	52.7	59.1	59.2	59.6	66.7	64.1	54.6	43.7	43.2	52.0	Thomas Pearce.
Klamath, Fort (1)	16.6	32.0	33.0	45.9	50.2	51.9	59.3	60.2	57.8	45.6	35.6	34.0	43.5	Signal Service.
Klamath, Fort (2)	17.9	32.2	35.1	47.6	53.6	52.9	64.1							U. S. post hospital.
La Grande	15.9	39.6	39.3		57.1	59.2	67.6							Rev. J. K. Romig.
Lakeview	21.9			50.1	52.4	55.6			67.4	52.1				Signal Service.
Linkville	20.1	37.6	38.3	50.8	54.5	55.6	[k]63.8		63.6	49.6	37.7	35.8		Do.
McMinnville		39.3	43.9	52.7	58.4	59.0	62.0	65.0	60.3	53.6	43.3	42.9		Prof. W. J. Crawford.
Mount Angel							68.4	72.0	67.3	55.2	44.1	43.4		Rev. F. B. Held.
Portland	30.0	44.0	46.2	55.0	62.3	61.9	67.6	69.0	66.0	56.3	44.0	43.7	53.8	Signal Service.
Roseburgh	35.1	44.5	47.2	56.0	60.1	61.3	67.2	68.7	66.3	56.5	47.0	46.9	54.7	Do.
Vernonia	29.5	42.8	41.5	51.0	54.6	56.7	59.9	63.5	63.7					Do.
Woodville	31.0	40.4	41.8	52.3	63.4	63.7	72.8	72.0	68.0					C. W. Clarke.
Yaquina Light-house	35.6	43.6	43.5	48.2	51.1	57.0	57.4	56.3	56.6	49.7				Dr. J. G. Jessup.
Pennsylvania:														
Altoona	28.4	34.7	34.7	49.2	60.1	71.3	71.2	71.0	61.2	49.4	45.4	37.7	51.2	Charles B. Dudley.
Beaver							[a]68.6	69.0	58.3	46.0				State weather service.
Bernice	15.6	23.3	26.1	40.6	52.6	63.9		65.1	54.9	41.1				Do.
Bethlehem	23.0	28.8	32.2	48.8	59.5	71.0	73.0	74.0	62.0	49.0	45.0	35.0	50.1	
Blooming Grove	19.3	25.6	28.0	44.0	56.9	71.3	72.5	69.0						John Grathwohl.
Carlisle	20.3	27.4	32.2	48.7	60.6	71.3	71.8		63.7	49.1	44.3	34.8		State weather service.
Catawissa		22.0	33.5	52.0	62.5	74.1	70.1	76.0	63.5	50.5	45.6	34.4		Robert M. Graham.
Chambersburgh	22.8	26.1	30.3		58.4	64.8	69.7	71.0			37.5			State weather service.
Charlesville	22.9	29.1	31.8	47.3	57.3	67.1	67.8	67.2	56.5	46.5	40.7	32.3	47.2	Do.
Clarion	19.8	26.7	25.7	44.0	55.6	65.4			55.4	44.3		30.0		Do.
Coatesville			32.3	47.3	58.5	69.5	69.8	71.5	64.6	47.4	43.1	32.4		Do.
Columbus	17.9	24.9	28.3	42.0	55.3	65.4	66.0	66.4	56.3	44.4	40.6	29.2	44.7	Do.
Corry	17.9	24.8	23.3	41.9	55.2	64.4	65.5	66.4	56.3	42.8	39.4	29.6	44.0	William Loveland.
Coudersport				[b]43.0	54.9	64.6	66.8	66.0	56.4	43.2	39.3			State weather service.
Drifton	18.3	25.2	27.0	42.5	55.4	66.6	65.9	66.4	57.4	44.2	39.9	29.9	44.9	H. D. Miller.
Dyberry	15.5	20.9	23.4	40.3	53.5	63.0	63.7	63.9	54.5	41.3	37.6	27.8	42.1	Theo. Day.
Eagle's Mere	13.6	22.2	30.2	41.6	52.5	66.6	64.0	66.5	55.6	40.5	37.0	25.6	43.0	State weather service.
Emporium			31.4	47.6	60.4	72.0	71.2	72.2	59.7	46.7	40.2	30.7		Do.
Erie	21.0	26.0	27.0	41.8	54.5	67.1	68.8	68.4	59.4	47.4	43.6	33.5	46.5	Signal Service.
Franklin (1)	20.3	25.4	29.0	42.8	56.8	65.9	67.6	65.5	55.0	43.9	38.5	29.8	45.0	Joseph Bell.
Franklin (2)					56.8	65.9	66.8	65.4						State weather service.
Germantown	24.0	31.0	32.5	47.8	61.6	72.8	71.4	73.0	64.1	47.8	44.2	34.0	50.4	Thomas Meehan.
Girardville	23.5	28.0	30.5	46.3	57.6	69.2	69.0	70.3	60.0	45.9	42.1	32.8	47.9	State weather service.

Table of monthly and annual mean temperature for 1888, *etc.*—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Pennsylvania—Continued.														
Grampian Hills	19.1	25.5	28.1	43.1	55.6	67.3	68.8	67.6	55.2	43.4	37.8	29.1	45.0	Nathan Moore.
Greensburgh	26.8	32.5	34.9	......	......	......	......	......	......	......	......	......	......	State weather service.
Greenville	20.4	26.5	28.8	43.2	55.7	65.6	67.9	67.0	56.7	45.3	35.3	36.3	45.7	Do.
Harrisburg	......	......	......	......	......	......	72.2	72.9	61.6	58.8	43.6	34.2	......	Signal Service.
Hollidaysburgh	22.7	29.5	31.8	47.2	57.9	79.7	68.7	69.0	59.0	47.0	41.6	33.0	48.9	State weather service.
Honesdale	......	......	......	......	53.7	63.7	64.0	65.0	56.1	41.5	38.0	28.0	......	Do.
Huntingdon	22.0	28.5	33.7	47.9	58.2	68.1	72.2	73.4	58.7	46.8	41.8	......	......	Do.
Indiana	23.8	30.2	32.7	47.3	57.9	67.6	68.0	68.8	57.4	46.3	43.3	33.3	48.0	Do.
Johnstown	......	......	......	46.5	56.5	67.7	67.8	68.5	57.2	......	......	......	......	Do.
Kutztown	......	......	29.9	44.8	59.1	69.8	......	69.7	59.5	44.1	......	......	......	Do.
Lancaster	23.6	28.7	32.4	48.1	59.6	70.5	72.2	......	61.6	48.0	44.1	34.8	......	Do.
Lebanon	18.7	27.8	32.4	48.3	58.3	69.3	70.0	70.8	60.7	47.5	43.2	33.3	48.4	Do.
Le Roy	13.8	21.0	23.1	38.6	51.6	62.8	63.9	64.0	54.6	40.9	36.6	26.0	41.4	G. W. T. Warburton.
Lock Haven	......	......	32.2	47.6	59.0	69.8	70.4	70.8	61.9	45.8	40.9	31.9	......	State weather service.
McConnellsburgh	24.3	30.9	33.5	48.7	59.3	69.0	69.5	69.4	58.6	47.9	42.6	33.5	48.9	Do.
Meadville (1)*	24.7	35.9	33.2	51.9	......	75.5	77.9	76.7	......	......	......	......	......	David Logan.
Meadville (2)	23.2	31.5	31.4	56.6	62.2	......	......	......	......	......	44.2	31.8	......	Prof. J. H. Montgomery.
Montrose	......	......	26.3	46.1	56.6	70.6	72.9	71.5	57.8	......	......	......		State weather service.
New Bloomfield	22.5	26.7	30.8	46.4	57.7	66.5	68.3	68.6	58.7	45.1	42.8	33.2	47.2	Do.
New Castle	23.1	30.1	33.6	49.5	60.5	70.5	71.7	70.8	60.6	48.4	43.2	33.5	49.6	Do.
Philadelphia (1)	26.2	32.9	34.7	50.5	60.9	71.8	73.8	75.2	65.4	50.3	......	......	......	Pennsylvania Hospital.
Philadelphia (2)	28.0	34.1	35.1	50.7	60.6	72.6	73.9	75.8	65.8	51.6	47.4	37.1	52.7	Signal Service.
Philipsburgh	19.9	28.2	31.0	40.9	54.9	64.0	66.5	64.7	53.5	42.5	37.9	29.1	44.4	G. F. Dunkle.
Pittsburgh	28.6	34.1	36.3	50.5	61.4	71.8	72.4	72.0	61.6	49.8	45.3	35.8	51.6	Signal Service.
Pottstown	24.3	26.3	33.5	49.7	60.5	73.2	73.0	74.3	64.3	49.2	46.0	35.0	50.8	State weather service.
Quakertown	21.8	29.0	31.6	46.1	57.2	69.4	70.5	69.9	60.9	45.8	42.6	32.5	48.1	J. L. Heacock.
Reading	24.4	29.4	33.7	49.0	50.4	72.5	71.9	71.4	62.5	47.9	43.3	31.5	49.0	C. M. Dechant.
Rimersburgh	......	......	30.1	47.6	58.4	......	......	70.4	......	44.0	40.0	......	......	State weather service.
Rochester	......	......	......	45.6	57.1	66.7	......	......	......	......	......	......	......	Do.
Salem Corners	21.1	......	......	......	54.4	65.5	66.3	65.8	59.2	41.7	38.7	27.8	......	T. B. Orchard, M. D.
Scranton	20.6	26.7	29.4	45.7	57.4	69.1	......	......	61.5	46.4	42.0	35.8	......	State weather service.
Selin's Grove	......	......	......	......	......	......	......	74.5	61.8	46.7	44.7	34.7	......	Do.
Shamokin	22.2	28.0	31.7	47.0	58.1	68.0	70.0	70.0	58.7	46.4	47.9	......	......	Do.
Smethport	......	......	......	......	54.5	64.2	66.6	65.4	55.0	43.2	39.3	31.1	......	Do.
Somerset	22.2	29.6	30.0	43.4	53.0	63.0	64.3	64.5	53.3	42.9	39.0	27.1	44.4	Do.
State College	21.1	27.8	31.0	46.8	57.8	70.5	70.0	69.9	57.7	46.3	41.2	31.9	47.7	Agricultural Experiment Stat'n.
Stroudsburgh	......	......	29.7	45.9	56.5	68.8	70.7	......	......	......	......	......	......	State weather service.
Swarthmore	25.8	31.2	33.1	48.4	58.7	70.3	71.3	72.5	63.0	49.0	48.0	33.7	50.4	Do.
Tionesta	......	25.8	28.4	43.0	54.0	64.2	......	64.8	55.7	44.3	......	31.9	......	Do.
Troy	......	27.0	28.8	41.0	55.5	67.3	67.8	64.9	55.7	43.3	40.1	29.7	......	M. Gustin.

Uniontown	30.4	35.2	37.4	50.5	63.8	72.3	72.3	71.2	61.9	50.5	44.7	35.5	52.1	State weather service.
Washington	24.4	32.5	36.9	50.6										Do.
Wellsborough	20.6	26.3	27.6	42.1	54.9	65.5	65.6	65.5	55.4	46.6	37.2	29.3	44.7	Hiram D. Deming.
West Chester	24.5	30.6	32.6	48.0	59.4	70.5	70.9	72.6	62.3	48.6	44.2	34.4	49.9	State weather service.
Westtown	25.5	30.9	34.5		60.8	69.7	70.8	70.2	60.8			34.6		Wm. F. Wickersham.
Wysox	21.4	27.0	30.6	42.6	57.4	67.6	68.7	68.0	56.7	43.8	39.7	30.5	46.2	State weather service.
York	24.4	29.7	33.9	50.9	60.2	70.8	71.3	73.7	61.6	48.6	44.0	33.9	50.2	Do.
Rhode Island:														
Block Island	24.8	29.7	30.8	41.1	49.9	62.3	65.1	67.8	60.8	49.7	45.4	35.4	46.9	Signal Service.
Bristol	21.3	27.4	31.4	41.7	53.1	65.6	66.9	68.6	59.4	48.3	43.4	33.8	46.7	New England Meteorological Society.
Narragansett Pier	23.4	29.6	31.9	42.5	53.6	65.4	66.8	65.9	61.2	47.8	43.5	34.0	47.4	Signal Service.
Newport	23.0	30.3	32.2	43.2	54.0	64.2	66.8	68.4	60.4	49.8	44.0	34.9	47.6	New England Meteorological Society.
Olneyville	21.4	29.8	32.3	44.2	55.8	69.8	70.6	72.0	61.9	49.3	46.0	36.6	49.1	Do.
Providence (1)	20.8	29.6	32.4					70.3	59.6	47.4	43.9	34.6		Do.
Providence (2)	19.0	28.2	31.4	42.7	54.8	68.2			59.8	46.7	42.7	32.8		Do.
Woonsocket	20.3	26.7	29.9	41.4	53.9	68.2	68.5	69.5	58.4	45.8	41.2	31.5	46.3	Do.
South Carolina:														
Abbeville	44.1	47.6	[e]50.9	64.8	69.7	[g]78.7	80.0	80.5	69.0	57.8	52.1			State weather service.
Aiken	48.2	51.0	54.3	66.9	71.9	79.0	80.4	78.9	69.7	61.7	54.9	46.4	63.6	Dr. W. H. Geddings.
Allendale				66.4	71.5	76.7	78.4	78.6	73.3	63.5				Signal Service.
Batesburgh				66.5	71.7	79.6	81.8	80.9	71.6	61.2				Do.
Belfast	49.0	52.6	54.7											State weather service.
Black's		53.4	[a]54.2	68.0	67.8	76.7								Do.
Blackville				66.0	72.4	[c]79.8	80.4	78.9	71.0	59.5				Signal Service.
Brewer Mine	43.2	48.0	50.5	64.8	69.0	76.9	79.2	79.1	72.6		53.5	42.6		State weather service.
Camden							81.8	75.9	67.8	54.4	49.4	38.7		Do.
Cedar Springs	42.6	46.4	50.0	62.7	65.6	74.8	73.6	76.0	63.8	53.0	46.3	38.7	57.8	J. T. Bayerly.
Charleston	51.0	54.0	55.2	65.6	72.3	78.2	80.2	81.4	75.3	66.0	57.7	49.2	65.5	Signal Service.
Cheraw	45.2	49.0	50.9	63.4	71.6	78.6	79.8	79.3	71.6	58.2		39.4		Do.
Chester				65.8	69.9	78.8	82.0	81.4	71.0	59.9				Do.
Clinton		[i]49.9	53.3	64.0	68.2	81.9		78.1			51.1	42.6		State weather service.
Columbia	47.1	50.6	52.8	66.1	71.2	79.1	80.4	80.1	71.6	61.2	54.6	45.9	63.4	Signal Service.
Conway		51.0	52.3	63.7	70.2	76.3		78.8			50.8			State weather service.
Evergreen	[c]44.6	47.1	50.3	62.5	67.8	76.4		77.0	70.7	59.7		41.0		Do.
Florence	[i]45.5			[b]66.0	72.6	79.9	81.7	81.0	72.9	61.8	57.1	39.0		Signal Service.
Georges				66.3	72.5	78.9								State weather service.
Greenville			51.6	[a]62.4	66.8	77.6	79.8	79.2	68.9	57.1				Signal Service.
Greenwood	44.4			64.5	71.0	78.8	80.8	80.1	71.4	60.7				Do.
Hardeeville	52.5	55.8	57.1	67.6	72.5	80.0	81.5	80.2	75.8	65.1				Do.
Jacksonborough				65.4	[a]72.3	78.2	79.5	79.0	74.4	62.4				Do.
Kingstree				[d]67.3	[a]73.2	[c]81.7	80.3	80.0	74.0	65.8				Do.
Kirkwood	41.4	45.3	47.7	59.6	67.3	75.2	77.1	75.9	67.8	54.4	49.5	38.8	58.3	Colin Macrae.
Marion	45.9	50.5	52.3	[c]57.3	65.9	[d]77.9		74.9	71.4					State weather service.
Newberry	45.9	49.6	52.1	65.6	70.6	78.3	81.2	80.4	70.7	58.8	51.8	43.7	62.4	Do.
Orangeburgh			53.6	66.1	[e]73.8	79.8								Do.
St. Matthew's				66.6	72.7	79.4	81.8	81.4	74.4	62.6				Signal Service.
Spartanburgh			51.0	[f]58.2	65.4	79.8	79.9	75.9	68.2	56.0				State weather service.
Statesburg	46.0	49.8	51.7	64.4	69.7	76.5	77.9	77.1	69.9	59.8	53.5	44.6	61.7	Dr. W. W. Anderson.
Timmonsville					[e]72.8	82.0		82.0	78.0	66.2	62.2	50.5		State weather service.
Trial					69.5	75.0	76.0	75.5	70.0	58.5	52.0	41.0		Do.

* One observation daily at noon.

Table of monthly and annual mean temperature for 1888, *etc.*—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
South Carolina—Continued.														
Williamston	....	....	48.6	[d]62.2	[b]66.7	[a]75.0	78.1	76.5	67.4	....	....	....	....	State weather service.
Windsor	....	....	....	....	....	....	80.0	79.0	65.0	....	....	....	....	Do.
Winnsborough	43.6	47.0	50.6	63.2	68.0	76.0	80.3	75.4	....	....	54.3	....	....	Do.
Yorkville	....	....	....	....	....	78.0	80.0	77.0	68.6	59.0	53.0	45.0	....	Do.
Tennessee:														
Andersonville	38.6	44.8	45.5	59.8	65.4	72.5	76.2	76.2	64.0	53.6	48.8	36.9	56.9	Do.
Ashwood	41.0	43.5	46.7	62.4	67.6	74.4	79.7	77.3	67.4	56.6	49.8	38.7	58.5	Rev. C. F. Williams.
Austin	37.8	42.3	47.4	62.4	68.0	79.3	80.9	79.4	68.4	52.5	54.1	40.4	59.4	P. B. Calhoun.
Beech Grove	39.7	43.8	....	60.9	62.2	73.7	77.0	....	66.7	....	....	....	....	State weather service.
Chattanooga	42.1	46.8	49.3	63.6	66.9	74.6	79.9	77.9	68.6	57.3	53.0	43.1	60.3	Signal Service.
Cookeville	36.0	41.6	46.6	....	....	....	....	....	68.4	....	....	....	....	State weather service.
Covington	36.3	43.0	48.6	64.4	68.5	73.5	80.1	77.5	69.1	57.5	49.4	42.3	59.2	Signal Service.
Fayetteville	39.4	44.4	47.0	61.6	66.7	74.6	78.8	77.0	67.5	55.3	51,3	42.9	58.9	State weather service.
Florence Station	38.1	42.8	47.6	63.3	67.2	75.1	79.0	77.8	66.4	56.0	50.3	40.7	58.7	Do.
Fostoria	38.9	43.6	46.1	57.5	60.3	67.6	74.6	72.2	62.0	51.6	48.7	40.5	55.3	Do.
Greenville	39.0	43.6	45.0	58.5	63.0	71.1	74.0	73.2	63.2	52.0	47.9	36.8	55.6	Do.
Grief	39.3	44.7	....	....	....	....	....	....	....	....	....	19.1	....	Do.
Hohenwald	37.8	43.5	46.0	61.9	62.2	74.0	75.7	74.0	68.1	53.3	47.8	37.9	56.8	Do.
Jacksborough	....	....	....	....	....	....	....	74.4	65.6	53.5	48.6	38.1	....	Do.
Jonesborough	....	45.0	47.7	60.6	....	....	....	....	....	....	....	....	....	Do.
Kingston Springs	....	42.3	46.9	61.9	65.7	73.4	78.4	77.5	68.2	55.4	49.8	39.2	....	Do.
Knoxville	40.0	45.3	46.9	61.3	65.2	73.3	77.3	76.8	66.9	54.7	50.0	39.4	58.1	Signal Service.
Lawrenceburgh	36.5	41.8	44.4	59.7	64.9	72.0	76.0	....	63.6	52.6	46.7	37.6	....	State weather service.
Leeville	....	....	....	....	....	....	....	....	....	56.9	50.6	41.1	....	Do.
Lewisburgh	....	43.8	....	....	....	75.7	79.9	79.9	69.2	55.4	....	38.1	....	Do.
McKenzie	....	....	....	....	....	....	....	....	68.3	56.3	50.6	42.8	....	Do.
Maryville	....	45.0	45.0	58.8	67.0	78.1	77.0	73.0	....	....	....	....	....	Do.
Memphis	38.2	44.0	49.5	65.5	69.2	75.4	82.5	79.3	70.6	59.0	50.7	43.6	60.6	Signal Service.
Milan	35.2	41.2	47.0	63.3	67.0	73.6	80.0	77.0	67.0	56.0	48.2	39.8	57.9	M. D. L. Jordan, M. D.
Nashville	36.6	41.3	46.6	61.9	66.0	74.0	79.8	78.4	68.1	56.4	49.6	40.4	58.3	Signal Service.
Newport	....	....	44.7	61.8	67.9	76.9	....	....	....	....	....	....	....	State weather service.
Nunnelly	36.7	40.8	46.4	61.1	63.4	76.6	76.6	75.0	65.5	54.4	49.0	40.3	57.2	Do.
Parksville	40.7	47.0	49.3	61.7	65.5	73.8	....	76.6	....	55.6	51.9	42.3	....	Do.
Riddleton	37.3	41.4	46.0	61.2	65.4	73.0	76.7	75.4	65.7	54.4	49.0	39.8	57.1	F. K. Fergusson.
Rogersville	39.4	43.5	45.0	58.8	64.5	70.0	76.4	79.4	66.5	51.4	49.1	37.7	56.7	Signal Service.
Savannah	40.8	....	....	....	64.9	68.4	77.8	....	69.4	....	50.9	43.0	....	State weather service.
Springdale	....	....	....	....	....	....	....	....	64.7	51.4	47.1	39.2	....	Do.
Trenton	33.9	40.1	45.7	61.6	64.9	71.5	78.4	75.5	65.8	54.9	47.6	39.3	56.6	Do.
Watkins	....	43.4	46.7	63.2	69.3	76.3	78.0	78.0	68.0	56.6	49.6	38.0	....	Do.
Waynesborough	39.3	42.5	45.2	60.0	64.2	70.3	76.4	74.8	64.8	55.6	48.6	39.7	56.8	Do.

Texas:													
Abilene	38.9	48.0	49.8	65.4	69.6	77.8	82.6	81.8	74.2	64.8	49.0	49.2	62.1	Signal Service.
Austin	45.4	57.4	65.6	73.2	75.0	82.6	84.0	84.2	78.0	69.1	56.6	54.0	68.8	Oscar Samostz.
Brady	38.4	47.9	49.3	64.6	69.3	76.3	80.0	79.5	71.2	62.8	46.2	47.9	61.1	W. H. Potter.
Brownsville	55.0	65.3	65.4	74.2	78.0	80.9	83.4	83.8	79.4	76.4	67.0	63.4	72.7	Signal Service.
Cedar Hill	41.0	....	54.0	72.0	66.0									J. P. Berry.
Clark, Fort	....	....	....	....	....	....	....	....	....	68.4	52.7	47.9	....	U. S. post hospital.
Cleburne	36.2	47.6	48.1	66.1	67.2	77.2	78.3	79.1	74.5	62.2	....	49.6	....	P. J. Norwood.
Concho, Fort	40.8	50.3	51.8	60.7	77.0	82.0	85.1	84.4	74.8	67.8	53.1	52.1	65.0	U. S. post hospital.
Corpus Christi	48.3	60.3	61.9	72.6	76.6	80.7	81.6	82.1	77.6	72.8	61.4	59.0	69.6	Signal Service.
Davis, Fort (1)	45.0	48.2	50.1	61.5	66.8	76.1	75.0	73.6	66.6	61.4	49.4	46.6	60.0	Do.
Davis, Fort (2)	....	....	....	....	....	....	....	....	[i]66.0	61.8	49.2	46.7	....	U. S. post hospital.
Decatur	37.3	45.8	49.5	66.9	68.6	76.7	80.3	79.7	72.1	63.1	49.3	47.9	61.4	H. D. Donald.
Elliott, Fort (1)	29.0	41.0	41.4	59.0	62.5	75.6	79.9	76.0	69.9	57.8	43.8	41.9	56.5	Signal Service.
Elliott, Fort (2)	....	....	....	....	....	....	....	....	[g]71.3	59.0	44.7	42.8	....	U. S. post hospital.
El Paso	44.8	50.1	54.6	66.9	71.4	83.0	82.1	81.0	73.0	65.7	53.0	46.2	64.3	Signal Service.
Gallinas	....	....	....	69.8	73.3	77.9	81.3	81.3	73.4	69.0	56.6	[d]52.7	....	Lum Woodruff.
Galveston	49.8	58.8	60.1	71.2	74.8	80.2	83.0	82.6	78.2	73.1	61.6	57.4	69.2	Signal Service.
Lampasas	....	....	....	67.1	71.0	74.0	81.0	80.1	70.8	67.9	51.1	51.7	....	Dr. C. M. Ramsdell.
McIntosh, Fort	52.3	62.0	62.3	73.7	80.1	85.3	88.7	88.8	78.9	74.7	59.5	[a]56.4	71.9	U. S. post hospital.
Mesquite	39.8	47.7	50.9	69.3	70.6	78.4	80.0	79.6	71.0	64.2	51.2	49.0	62.6	Silas G. Lackey.
Mexia	....	....	....	....	72.0	79.5	82.2	80.5	....	64.0	52.8	51.4	....	Charles F. Mercer.
New Ulm	42.0	54.0	57.3	70.9	72.6	77.9	81.6	80.6	76.5	68.5	57.1	54.8	66.2	C. Runge.
Palestine	43.4	52.3	53.3	68.5	70.4	77.7	81.0	80.7	73.6	68.0	55.4	51.6	64.7	Signal Service.
Ringgold, Fort	54.7	64.2	65.2	75.9	80.6	82.9	86.2	86.4	78.1	76.2	63.8	60.4	72.9	U. S. post hospital.
Rio Grande City	54.7	63.6	64.2	74.5	78.6	81.2	85.7	86.4	79.6	76.3	64.1	60.8	72.5	Signal Service.
San Antonio	48.0	56.5	56.6	69.3	72.8	78.0	82.4	82.8	75.2	70.4	57.0	55.6	67.0	Do.
Silver Falls	38.9	[b]46.8	48.8	63.3	65.8	....	[j]83.9	74.8	73.6	62.3	45.5	46.6	....	C. M. Tilford.
Utah:														
Brock's	....	....	[i]43.8	54.6	58.5	66.4	74.4	69.5	68.1	51.2	36.8	27.2	....	Signal Service.
Du Chesne Fort	3.5	21.9	35.2	51.2	56.1	69.6	72.9	67.2	64.4	48.8	34.9	23.6	45.8	Do.
Lake Park	....	....	....	....	....	....	....	73.4	67.8	51.4	38.3	32.0	....	E. Olson and F. Blumel.
Salt Lake City	23.2	38.5	40.4	55.5	58.6	68.8	76.6	74.8	70.6	54.0	41.6	35.8	53.2	Signal Service.
Vermont:														
Brattleborough (1)	12.9	22.4	28.0	42.7	55.7	68.3	69.1	68.4	58.0	43.2	38.7	28.9	44.7	W. H. Childs.
Brattleborough (2)	11.4	22.9	28.2	41.6	54.2	66.2	67.3	67.0	57.1	42.5	38.4	29.3	43.8	New England Meteorological Society.
Burlington	10.5	18.6	26.2	42.6	57.2	68.9	71.3	68.9	58.0	42.8	37.3	27.3	44.1	W. B. Gates.
Chelsea	7.6	17.2	20.1	35.2	50.3	61.4	61.6	60.9	52.2	38.1	33.6	24.7	46.9	New England Meteorological Society.
Coventry	....	....	....	....	....	....	....	....	54.0	38.4	33.4	24.2	....	W. H. Tibbetts.
East Berkshire	....	....	....	....	....	....	....	....	51.0	37.0	33.3	23.6	....	J. H. Mears.
Guilford Centre	12.7	21.7	26.3	38.8	53.6	....	....	....	....	....	....	....	....	New England Meteorological Society.
Jacksonville	11.5	20.1	24.9	35.9	53.3	64.5	64.4	63.0	53.9	39.4	35.3	26.7	41.1	Do.
Lunenburgh	7.6	17.7	22.5	33.8	51.3	65.1	66.8	67.6	56.6	40.7	37.2	28.1	41.2	Dr. H. A. Cutting.
Manchester	11.9	20.7	24.5	39.6	55.4	66.6	66.9	67.5	57.3	41.8	38.0	28.3	43.2	Rev. E. P. Wild.
Marlborough	9.8	19.0	22.4	35.9	....	....	....	....	....	....	....	....	....	New England Meteorological Society.
Middlebury	....	16.0	25.5	37.0	53.2	64.8	60.1	78.1	69.0	41.6	35.8	26.0	....	S. Holton.
Newport	6.7	14.6	25.4	37.6	[k]52.8	68.0	68.8	[j]68.3	[j]57.8	41.5	....	....	....	M. B. Trasher.

Table of monthly and annual mean temperature for 1888, *etc.*—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Vermont—Continued.														
Northfield	7.1	16.0	21.6	35.0	51.6	63.5	62.9	63.6	54.2	39.0	34.0	25.4	39.5	Signal Service.
Strafford	6.9	17.4	23.4	37.9	53.7	68.3	68.8	64.4	57.4	40.6	35.4	25.6	41.6	H. F. J. Scribner.
Vernon	11.4	21.8	27.4	40.5	55.7	67.6	68.9	67.8	58.9	43.9	39.3	29.7	44.4	New England Meteorological Society.
Woodstock	5.5	17.2	25.2	....	....	....	....	....	....	....	....	....	....	Do.
Virginia:														
Bird's Nest	36.1	40.0	39.3	52.5	63.6	73.5	74.7	77.4	68.5	55.4	50.1	38.9	55.8	C. R. Moore.
Cape Henry	39.8	40.2	43.0	53.6	65.3	73.8	75.6	78.8	71.2	57.8	54.6	42.4	58.0	Signal Service.
Christiansburgh	35.9	41.0	41.4	52.4	60.8	70.1	71.4	72.0	[f]59.2	47.8	43.6	36.2	52.6	Do.
Dale Enterprise	34.0	41.4	41.3	[k]53.8	65.1	74.3	76.4	77.5	64.6	54.5	49.6	40.8	56.1	L. J. Heatwole.
Lynchburgh	35.6	40.5	42.7	56.3	64.0	74.1	75.2	76.8	64.6	54.0	49.4	40.0	56.1	Signal Service.
Marion	[a]33.3	[a]36.6	39.4	[c]51.8	[e]61.1	[a]70.0	[b]72.0	[e]69.5	[c]61.8	[c]48.6	[e]42.6	[b]33.1	51.6	A. T. Lincoln.
Monroe, Fort	37.3	40.4	42.8	54.3	66.1	75.5	76.5	[b]80.6	69.7	55.9	52.3	39.8	57.6	U. S. Post Hospital.
Norfolk	38.1	41.9	43.9	55.4	64.9	73.6	75.6	78.4	70.2	57.1	53.5	42.6	57.9	Signal Service.
Petersburgh	34.0	[a]39.3	42.2	54.8	66.0	74.0	74.2	80.2	....	[g]54.2	49.2	37.4	....	Prof. James M. Colson.
Rappahannock	24.7	35.4	42.3	42.4	55.4	[e]68.6	67.1	[m]78.0	....	....	....	....	....	W. H. Ireland.
Spottsville	....	....	....	....	....	....	....	....	....	54.5	51.3	38.7	....	B. W. Jones.
Summit	29.0	35.7	37.8	51.6	62.2	71.0	71.0	72.4	61.8	51.0	44.4	34.8	51.9	J. R. Sim.
University of Virginia	31.9	39.1	41.2	55.9	63.7	72.4	78.6	79.5	....	....	....	....	....	James Wearmouth.
Variety Mills	32.2	37.9	40.6	[a]53.1	63.0	72.0	[g]72.4	74.6	....	....	....	....	....	J. Howard Micklem.
Wytheville	35.2	40.0	41.3	54.8	60.5	71.2	74.0	74.3	60.2	[e]46.3	45.1	35.1	53.1	Howard Shriver.
Washington Territory:														
Blakeley	33.5	43.0	44.0	51.7	57.6	61.5	62.5	62.2	59.5	52.0	44.0	43.0	51.2	R. M. Hoskinson.
Canby, Fort	35.5	43.3	43.9	49.1	53.1	57.7	59.9	59.5	59.8	54.8	46.6	46.5	50.8	Signal Service.
Neah Bay	35.6	43.4	42.8	48.2	52.9	57.2	56.2	59.0	57.0	49.7	46.0	47.0	49.6	Do.
Olympia	32.5	42.2	43.7	50.4	57.4	60.3	62.3	63.8	60.6	53.8	43.6	42.6	51.1	Do.
Port Angeles	31.7	40.5	40.7	46.1	50.7	55.4	56.9	57.8	55.6	49.2	40.9	41.0	47.2	Do.
Pysht	32.4	....	40.6	46.4	51.0	55.6	58.0	58.2	54.9	49.5	42.5	43.5	....	Do
Seattle	35.2	43.3	50.2	56.6	62.8	66.8	68.4	71.2	70.3	....	....	....	....	Do.
Spokane Falls	15.5	38.3	38.4	51.5	59.8	61.4	68.2	71.4	64.6	49.4	36.0	33.5	49.0	Do.
Spokane, Fort	13.5	37.1	39.7	52.8	61.8	65.0	71.2	73.7	65.9	50.8	36.6	32.6	50.0	U. S. post hospital.
Tacoma	32.0	41.2	43.1	51.0	59.0	60.9	65.0	66.3	61.9	53.5	44.2	43.5	51.8	Edw. N. Fuller.
Tatoosh Island	36.4	43.2	43.2	46.5	49.8	55.1	56.8	56.8	56.4	52.7	47.3	47.8	49.8	Signal Service.
Townsend, Fort	55.4	43.8	43.9	50.2	56.6	61.7	63.1	62.5	....	49.3	43.0	....	....	U. S. post hopsital.
Vancouver, Fort	....	....	....	....	....	....	....	....	62.6	53.0	42.0	42.0	....	Do.
Vashon Island	28.1	39.5	40.7	51.0	59.4	61.8	67.8	65.3	61.2	54.3	44.5	41.8	51.3	Mrs. C. B. Carpenter.
Walla Walla	22.1	45.4	44.7	58.1	64.8	65.1	73.4	76.6	69.2	56.8	39.2	35.6	54.2	Signal Service.
Walla Walla Fort	22.2	44.2	44.9	58.2	....	66.2	76.4	78.6	....	56.8	39.5	36.1	....	U. S. post hospital.
West Virginia:														
Clarksburgh	....	35.0	38.1	52.0	63.5	74.5	74.5	....	....	....	....	....	....	R. T. Lowndes.

Helvetia	32.8	37.2	37.7	48.1	57.8	66.7	68.0	67.8	58.6	45.4	42.6	32.5	49.6	Dr. C. F. Stucky.
Middlebrook	....	30.9	30.7	44.1	....	63.9	....	64.7	53.8	42.3	38.5	28.0	....	S. F. H. Hewit.
Parkersburgh (1)	....	....	....	....	....	....	73.1	72.0	61.9	49.0	45.2	35.7	....	Signal Service.
Parkersburgh (2)	....	34.8	37.8	52.2	61.2	70.5	72.6	70.6	61.2	44.2	44.0	34.3	....	Theo. G. Field.
Rockport	....	....	....	....	....	....	....	70.6	62.0	....	44.0	16.4	....	R. D. J. Echols.
Wisconsin:														
Beloit	8.1	17.4	26.1	44.6	52.2	65.5	70.6	67.6	56.5	....	....	....	....	Beloit College Observatory.
Delavan	8.0	17.0	24.8	43.6	52.0	65.9	69.8	66.8	[b]52.8	44.8	36.8	28.6	42.6	George L. Collie.
Embarrass	6.5	15.6	20.1	39.9	51.2	71.9	70.0	66.6	58.2	49.2	36.6	26.6	42.7	J. E. Breed.
Fond du Lac	10.6	19.0	22.7	40.4	48.8	66.9	69.4	65.4	55.6	45.5	35.2	27.3	42.2	J. C. Wedge.
Fredonia	....	16.7	21.9	44.3	49.6	65.1	69.5	66.4	....	....	....	....	....	B. H. Meyer.
Green Bay	5.5	15.2	20.3	39.4	49.7	67.0	69.8	66.0	57.0	44.6	36.2	26.8	41.5	Signal Service.
La Crosse	2.6	15.6	22.2	44.1	51.7	67.9	73.7	67.8	57.8	46.6	37.2	28.0	42.9	Do.
Lancaster	1.3	12.5	26.4	45.6	51.5	65.2	71.0	69.2	57.7	....	....	....	....	Edw. Pollock.
Madison	6.0	16.8	23.2	45.4	51.7	67.5	71.8	67.4	57.8	46.2	37.3	28.4	43.3	Washburne Observatory.
Manitowoc	10.5	18.2	24.4	40.1	49.3	63.8	67.5	65.5	57.3	46.1	38.9	31.5	42.7	Miss Clasina Lüps.
Milwaukee	10.6	19.8	26.1	41.1	47.6	63.7	68.2	66.9	58.2	47.6	39.6	30.2	43.3	Signal Service.
Prairie du Chien	1.6	18.9	24.8	46.4	53.5	69.5	....	....	....	....	....	....	....	College of Sacred Heart.
Wyoming:														
Bridger, Fort	13.6	26.8	28.5	44.3	46.9	57.9	64.5	61.2	....	....	....	....	....	Signal Service.
Cheyenne	24.0	32.9	29.3	47.8	47.6	63.3	69.2	63.2	58.6	45.8	33.1	34.0	45.7	Do.
Laramie, Fort (1)	19.8	35.3	30.6	51.6	53.4	66.8	75.6	66.1	[b]62.6	50.6	33.0	30.4	48.0	Do.
Laramie, Fort (2)	19.6	34.4	30.1	52.5	54.8	70.1	76.2	69.0	63.7	....	....	....	....	U. S. post hospital.
McKinney, Fort (1)	13.9	31.5	22.7	48.0	47.9	60.2	68.8	64.4	61.8	45.9	34.5	34.8	44.5	Signal Service.
McKinney, Fort (2)	17.7	31.6	23.2	49.1	48.7	60.0	68.4	65.5	62.7	46.8	35.3	34.1	45.3	U. S. post hospital.
Mammoth Hot Spring	10.2	25.8	21.9	41.8	44.3	54.6	64.1	59.1	57.8	41.0	25.4	22.1	39.0	Superintendent of Yellowstone National Park.
Pilot Butte, Camp	....	....	....	....	....	....	....	....	....	45.5	29.3	19.6	....	U. S. post hospital.
Sheridan, Camp	10.2	25.8	21.9	41.8	44.6	54.6	64.1	59.2	58.6	42.5	26.7	22.5	39.4	Do.
Washakie, Fort. (1)	6.7	31.3	27.2	48.8	48.5	60.1	69.2	64.0	59.6	45.7	26.7	21.1	42.4	Signal Service.
Washakie, Fort (2)	6.6	32.2	27.7	38.6	49.2	61.1	69.2	64.1	59.4	45.1	26.3	20.5	41.7	U. S. post hospital.

APPENDIX 20.

Mean of the maximum, and the minimum temperature (in degrees Fahrenheit) at the cotton-region stations of the United States Signal Service from April to October, 1888, inclusive.

[Letters of the alphabet indicate number of days missing rom the record.]

	April.		May.		June.		July.		August.		September.		October.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Alabama:														
Decatur	80.0	49.9	83.8	56.6	91.8	63.9	95.3	68.5	92.2	67.6	80.7	58.1	70.9	45.7
Eufaula	84.4	56.4	81.5	60.4	86.1	66.6	^{c}90.0	^{c}70.8	^{c}86.8	^{c}70.4	79.4	63.1	71.9	52.6
Evergreen	81.8	57.0	86.3	59.9	92.7	69.0	92.4	70.8	82.6	70.7	80.5	64.9	75.9	55.4
Port Deposit	80.6	57.6	84.1	62.5	90.0	68.3	93.8	70.7	91.6	69.4	82.0	65.1	72.9	53.5
Livingston	80.1	54.8	83.3	60.9	90.5	67.3	93.3	71.5	90.0	71.2	82.5	63.4	74.7	51.0
Marion	79.5	53.7	84.0	61.5	90.5	68.4	93.6	72.3	89.9	70.0	81.3	61.9	73.5	53.2
Mobile	77.7	61.0	80.0	64.1	85.3	70.3	90.7	74.2	87.0	72.9	83.6	67.9	76.4	58.6
Montgomery	79.4	58.0	82.2	62.7	88.4	68.7	92.5	72.9	90.3	71.5	82.4	65.5	74.0	54.4
Opelika	77.9	55.4	82.4	60.1	89.8	67.1	91.0	70.2	89.4	69.3	78.5	62.3	69.7	51.4
Pineapple	81.1	54.6	86.5	59.4	91.9	66.7	95.2	70.9	90.2	70.8	82.9	63.1	74.7	52.6
Scottsborough	77.4	52.0	80.0	58.5	87.5	65.7	91.5	69.7	90.2	69.0	^{c}79.1	^{c}60.0	^{c}69.5	^{c}47.6
Selma	^{c}79.5	^{c}54.1	^{a}83.3	^{a}60.2	90.6	66.9	^{a}94.0	^{a}70.2	^{c}91.3	^{c}70.3	82.3	64.0	^{a}75.1	^{a}51.3
Tuscumbia	78.3	50.4	81.7	57.9	87.3	65.2	93.0	70.3	89.1	69.0	80.8	59.6	74.5	48.3
Arkansas:														
Brinkley	78.0	53.8	^{c}83.6	^{d}67.9	^{c}87.7	^{c}68.7	^{m}96.3	^{m}77.7	^{i}95.5	^{h}75.4	......	....	....	....
Devall's Bluff	^{h}76.7	^{h}55.0	79.1	56.5	^{c}85.9	^{c}64.8	93.2	69.5	^{a}88.9	^{c}70.4	^{c}80.3	^{c}56.8	^{b}71.5	^{b}45.6
Forrest City	73.9	60.4	78.3	63.2	85.5	67.7	92.0	72.3	89.3	69.0	82.6	64.7	70.3	54.6
Fort Smith	76.3	55.5	79.2	58.0	86.2	67.4	92.7	71.4	89.5	70.5	83.1	59.7	71.3	48.4
Helena	78.7	53.9	^{c}82.8	59.1	88.5	67.0	93.4	71.2	90,7	73.2	^{c}80.1	^{c}59.3	^{b}69.6	^{b}49.3
Little Rock	76.8	55.0	79.4	58.0	84.1	67.3	91.0	72.9	88.0	71.5	80.8	61.8	67.5	49.5
Malvern	80.1	40.3	83.5	45.0	87.9	67.6	^{b}95.3	^{b}80.2	^{c}94.2	^{c}74.9	^{c}87.1	^{c}68.0	....	....
Monticello	80.4	43.0	83.7	^{b}53.4	88.6	68.2	93.2	71.6	91.8	72.0	84.3	61.9	^{c}75.6	^{c}53.0
Newport	72.7	52.9	83.0	56.8	^{a}89.1	^{a}65.6	97.0	71.2	90.9	69.1	^{r}83,9	^{r}61.4	^{c}69.4	^{c}46.0
Pine Bluff	79.5	56.2	83.5	59.4	89.4	68.5	94.2	72.8	91.1	71.7	....	....	....	....
Prescott	76.0	56.5	79.5	60.9	^{a}84.5	^{a}69.0	^{l}93.3	^{l}71.1	89.4	73.0	^{h}81.5	^{h}64.8	70.0	52.7
Russellville	79.8	52.8	82.4	56.7	88.2	66.5	94.0	71.4	^{d}91.9	^{d}69.4	^{a}83.0	^{a}57.4	^{f}70.0	^{f}45.7
Texarkana	^{u}74.3	^{u}51.9	81.1	59.2	87.0	70.1	95.4	71.4	94.5	72.1	87.6	60.6	75.6	52.6
Florida:														
Live Oak	83.4	58.5	88.8	62.9	92.8	57.2	94.5	70.8	^{d}92.6	^{d}71.9	86.3	68.5	....	....
Georgia:														
Albany	^{a}82.2	^{a}59.6	85.6	65.7	91.0	68.0	^{b}94.0	^{b}75.7	91.8	66.2	^{b}84.1	^{b}59.9	....	....
Allapaha	^{a}80.5	^{a}57.3	85.1	61.4	91.4	67.9	93.2	70.6	91.5	70.8	82.9	65.9	^{a}76.1	^{a}56.9
Athens	80.1	51.3	85.5	59.7	93.1	66.2	95.5	69.4	94.1	69.3	80.1	61.3	68.9	47.5
Atlanta	74.2	54.2	77.6	59.9	85.0	66.5	88.4	69.9	87.1	70.0	75.8	61.5	66.6	49.8
Augusta	79.8	54.7	83.5	62.0	91.2	68.7	93.4	70.9	92.2	71.2	81.3	64.9	73.1	51.5
Bainbridge	81.6	58.6	84.9	63.6	89.5	70.3	92.0	73.2	90.2	73.1	84.8	63.8	77.1	57.0
Camak	78.0	53.1	82.0	61.1	88.4	68.3	91.8	71.0	90.1	71.1	79.3	64.3	71.1	50.8
Cartersville	77.0	51.4	79.7	59.2	87.6	64.6	89.9	69.0	89.9	68.9	74.4	59.2	68.8	48.2
Columbus	77.8	56.8	83.2	60.9	90.0	69.3	^{a}91.3	^{a}72.9	90.2	71.4	^{j}85.7	^{d}70.1	....	....
Eastman	80.5	53.3	88.0	58.4	92.2	65.7	^{a}94.0	^{a}68.7	91.9	68.5	^{a}82.8	^{a}62.6	^{a}75.1	^{a}50.9
Fort Gaines	81.0	57.1	85.3	62.5	91.3	68.8	94.0	72.1	95.2	72.4	86.6	66.9	78.6	54.4
Gainesville	73.7	49.3	75.9	57.0	85.6	64.7	86.9	68.4	85.7	65.8	77.1	58.4	67.4	46.1
Griffin	77.1	55.6	81.5	61.4	87.8	68.1	90.4	71.2	88.7	71.1	79.7	63.0	70.1	51.5
Jesup	82.9	57.4	89.5	62.6	94.6	71.1	94.7	70.6	93.7	71.6	85.2	67.6	77.3	57.2
Macon	80.5	56.5	85.8	61.6	92.4	67.5	93.0	71.5	91.2	71.9	81.7	65.7	69.4	50.4
Millen	82.1	54.9	86.7	61.9	92.9	67.5	95.5	70.0	92.3	70.7	82.9	65.2	74.7	52.2
Newnan	79.0	52.5	84.4	60.2	90.1	66.9	^{a}93.3	^{a}70.4	92.4	69.4	82.5	63.0	72.3	51.1
Quitman	83.6	60.2	87.7	62.8	92.5	68.9	^{c}92.4	^{c}78.5	90.4	72.6	86.1	68.7	82.6	58.7
Savannah	76.8	58.1	82.1	65.8	84.4	69.8	89.5	71.3	88.4	72.9	81.4	67.9	74.1	57.0
Smithville	^{c}82.5	^{c}55.3	85.6	61.2	93.5	67.8	95.4	71.9	93.6	70.7	84.1	65.1	^{c}77.3	^{c}53.0
Thomasville	80.9	57.0	82.4	61.6	92.6	67.2	94.5	72.2	93.7	72.3	84.6	66.5	^{c}82.3	^{c}57.3
Toccoa	76.8	50.9	78.7	57.5	87.4	65.5	89.7	68.1	88.3	67.5	76.1	59.2	67.1	47.3
Union Point	......	50.1	81.9	56.6	87.9	64.4	92.6	66.5	91.9	66.9	79.8	60.1	71.7	46.6
Way Cross	^{f}83.4	^{g}58.3	87.9	64.1	^{i}96.4	^{i}72.1	^{b}94.4	^{b}70.8	^{w}93.6	^{w}74.4	^{q}75.7	^{q}63.4	76.8	58.1
Washington	78.1	53.1	82.1	59.7	90.5	66.0	93.7	68.3	91.0	69.7	76.9	62.8	69.2	49.4
Waynesborough	79.1	57.1	82.2	60.6	91.4	69.1	94.5	74.2	92.8	71.8	78.1	61.2	....	....
West Point	77.1	60.7	80.5	66.4	87.1	73.3	91.2	77.1	88.8	75.3	80.4	68.2	71.4	56.2
Louisiana:														
Alexandria	80.1	59.3	83.3	61.7	86.8	70.3	93.4	70.7	92.2	71.2	87.5	63.6	79.0	58.2
Amite City	82.5	57.8	87.2	60.4	91.4	68.0	94.1	71.8	90.4	71.3	^{c}87.3	64.5	79.7	56.1
Cheneyville	81.0	56.6	^{a}84.2	^{a}54.2	88.8	59.1	^{b}92.5	^{b}68.9	89.7	65.6	89.2	^{a}63.8	^{r}72.9	^{r}51.3
Coushatta	....	....	....	....	^{k}89.6	^{k}70.5	94.4	71.1	89.5	71.5	84.4	60.5	74.3	53.4
La Fayette	80.1	61.9	85.7	62.6	88.5	61.9	92.1	64.0	89.4	74.0	85.9	67.0	79.0	58.5
Minden	81.5	58.2	84.9	60.4	89.9	69.2	96.0	71.6	92.4	73.1	88.7	62.4	76.8	54.8
Monroe	81.3	59.6	85.1	62.5	89.2	71.0	93.2	74.5	90.4	72.6	82.2	64.1	73.5	51.4

Mean of the maximum and the minimum temperature, etc.—Continued.

	April.		May.		June.		July.		August.		September.		October.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Louisiana—Continued.														
Natchitoches	81.1	58.9	85.4	63.7	88.2	70.3	92.5	73.0	92.5	73.2	85.0	63.4	74.9	56.2
New Orleans	76.0	63.2	83.1	65.9	85.9	72.6	90.7	76.5	82.6	74.6	85.0	70.4	79.2	62.8
Shreveport	78.6	60.4	81.8	62.8	86.9	70.2	92.3	73.2	91.2	72.3	84.6	63.4	75.5	55.7
Mississippi:														
Fort Gibson	82.9	56.0	84.9	59.7	90.1	67.5	94.0	70.2	91.8	71.1	85.4	62.2	78.0	51.4
Macon	81.6	54.1	87.1	60.7	92.6	69.4	96.3	73.0	94.1	69.7	87.4	58.4	74.3	48.8
Natchez	81.2	59.7	86.5	62.8	[a]91.8	[a]69.4	93.5	72.8	88.1	72.7	82.8	63.3	75.4	53.4
Okolona	[b]81.1	[t]51.6	85.5	60.1	91.9	66.5	96.3	71.8	92.8	70.4	82.2	61.2	72.5	50.3
University	77.8	55.1	80.4	59.9	85.9	67.1	91.5	71.6	89.3	71.1	79.2	62.5	70.0	51.3
Vicksburg	79.2	58.8	82.0	62.8	86.7	68.9	92.4	73.1	89.8	73.0	83.3	64.7	73.9	55.3
Waynesborough	81.1	54.5	84.3	61.2	91.4	67.2	95.8	71.8	91.5	72.0	85.2	65.8	79.0	54.5
North Carolina:														
Charlotte	75.5	51.4	79.3	58.3	88.0	66.5	90.1	67.9	89.9	68.4	77.4	60.6	67.4	47.5
Goldsborough	[a]74.8	[a]49.1	79.9	60.9	89.8	68.0	90.4	68.1	90.7	70.1	80.5	64.3	69.4	48.4
Lumberton	75.2	49.7	80.5	60.2	88.5	63.4	89.1	66.6	89.9	68.1	79.6	63.6	69.8	47.8
New Berne	73.2	50.9	82.7	59.3	89.3	67.1	89.8	66.5	90.7	70.5	81.3	63.7	[h]74.1	[h]50.0
Raleigh	70.4	47.6	76.2	58.0	86.5	65.9	89.5	67.4	88.1	68.1	76.7	60.4	65.6	46.1
Wadesborough	77.0	50.8	77.6	59.3	90.1	67.0	91.1	67.6	89.1	68.0	77.7	62.5	67.2	47.3
Weldon	73.9	43.7	79.6	58.2	85.9	64.0	91.6	63.5	93.6	66.3	79.2	60.3	67.9	43.7
Wilmington	72.0	52.0	77.2	63.1	85.3	68.4	86.0	68.9	86.4	70.0	80.3	65.4	70.8	54.3
South Carolina:														
Allendale	76.4	56.5	80.1	62.9	85.4	68.0	88.5	68.3	88.4	[b]68.9	81.7	64.9	75.0	52.0
Batesburgh	79.3	53.8	83.0	60.5	91.9	67.4	94.3	69.2	92.4	69.4	80.9	62.3	71.9	50.5
Blackville	78.9	53.1	83.2	61.7	91.2	[c]68.5	92.2	68.7	88.7	69.1	78.6	63.4	69.9	49.1
Branchville	80.1	55.9	84.1	63.0	90.5	68.6	94.0	69.2	90.6	69.8	81.3	65.4	74.0	51.2
Charleston	74.7	58.9	79.5	67.3	86.5	71.8	87.1	73.3	87.1	75.2	81.2	69.6	73.0	58.7
Cheraw	78.6	48.7	83.8	59.4	91.1	66.1	92.6	67.0	90.7	67.9	80.4	62.7	71.0	45.4
Chester	79.4	52.3	81.9	58.0	90.9	66.7	94.9	69.2	93.4	69.4	80.3	61.8	71.6	48.2
Columbia	76.6	54.5	80.6	62.1	88.8	68.9	91.0	70.2	89.5	70.7	78.8	64.6	70.8	51.5
Florence	[a]79.1	[a]53.0	83.3	62.1	91.8	68.1	93.8	69.6	91.8	70.3	80.9	64.9	71.8	51.9
Greenville	77.5	49.2	79.3	57.6	90.0	65.2	92.9	66.7	91.6	66.8	78.8	59.0	68.8	45.4
Greenwood	76.7	52.4	80.8	61.2	89.4	68.2	91.4	70.3	89.7	70.5	79.4	63.3	72.0	49.4
Hardeeville	80.5	54.7	86.0	63.1	92.2	67.8	92.8	70.2	91.1	68.6	84.3	67.2	76.3	53.9
Jacksonborough	79.8	51.0	[b]85.2	[b]59.5	90.7	65.8	92.8	66.2	90.4	[l]67.5	83.2	65.5	[b]74.4	[b]50.3
Kingstree	[d]80.0	[d]54.7	[b]85.3	[b]61.1	[c]95.0	[c]68.4	[a]92.7	[a]67.9	[l]92.2	[l]67.7	82.7	65.2	75.3	56.2
St. George's	80.0	52.7	84.3	60.7	91.4	66.4	92.7	69.7	90.9	68.6	82.2	64.7	74.7	50.6
St. Matthew's	79.9	53.4	83.2	62.2	90.0	68.8	93.9	70.0	89.3	73.5	80.4	68.4	73.5	51.8
Spartanburg	76.9	47.7	80.2	56.4	90.2	63.8	94.7	65.1	90.3	61.5	78.7	57.7	68.5	43.4
Tennessee:														
Arlington	75.5	52.2	78.1	57.6	83.2	65.5	90.5	69.8	86.3	68.6	77.9	58.9	67.2	48.1
Bolivar	75.0	59.7	78.3	53.4	81.7	57.0	90.4	67.7	87.1	66.5	80.8	59.0	71.0	50.4
Brownsville	78.8	51.9	81.3	57.8	87.7	66.1	93.5	70.3	[e]89.6	69.0	79.4	58.5	69.7	47.6
Chattanooga	75.5	52.7	76.6	58.4	85.6	65.5	89.6	70.2	87.7	68.1	77.8	59.6	67.5	47.3
Covington	79.0	52.3	81.1	57.5	88.1	65.1	94.6	69.6	90.0	68.5	80.1	59.0	69.3	49.3
Dyersburgh	79.0	51.0	81.5	[d]59.4	89.6	66.3	96.2	[a]70.3	90.8	68.8	[a]80.5	[a]58.4	68.9	46.2
Grand Junction	76.9	52.7	80.4	58.3	85.2	65.2	91.7	70.0	88.2	69.1	78.8	59.3	69.1	48.4
Milan	78.8	50.9	81.8	56.7	88.8	65.1	94.4	69.8	90.4	68.8	79.2	57.7	68.6	46.6
Memphis	75.7	55.8	78.2	60.1	84.8	67.9	94.3	73.1	87.6	72.5	79.2	62.0	67.6	50.9
Nashville	74.0	51.1	76.4	57.0	85.0	65.4	90.0	69.6	87.5	69.3	77.2	59.0	66.6	47.5
Texas:														
Belton	78.7	61.1	81.5	61.3	88.3	70.1	93.6	71.3	93.0	72.0	86.4	64.1	80.1	58.5
Brenham	82.5	64.4	85.1	65.0	90.8	72.5	93.8	73.7	93.8	74.4	88.0	67.0	81.3	61.4
Columbia Station	80.5	65.1	83.4	65.5	87.7	71.8	92.0	72.3	91.0	73.4	85.6	67.8	80.4	62.1
Corsicana	81.1	60.6	83.2	62.2	[i]91.3	[i]69.3	94.6	72.8	94.1	73.5	86.4	63.6	80.0	55.4
Cuero	....	....	[r]86.5	[r]79.5	89.5	81.9	94.2	84.5	94.6	80.6	89.3	75.0	85.1	73.6
Dallas	81.4	60.7	83.0	62.1	90.0	71.5	94.9	74.3	92.5	74.6	87.7	63.3	78.5	56.0
Galveston	75.2	67.8	79.5	70.5	87.1	76.2	87.4	78.6	87.4	77.8	83.0	73.4	77.2	68.8
Hearne	78.1	62.3	80.4	63.3	86.2	71.1	91.2	71.8	91.6	73.1	85.3	65.9	78.2	58.1
Houston	82.0	64.3	84.6	63.9	90.0	72.3	92.8	82.5	91.9	74.3	86.1	66.7	80.8	61.4
Huntsville	81.6	63.5	84.9	63.9	89.8	72.2	93.5	73.5	93.8	74.1	88.1	65.9	[c]81.7	60.7
Longview	81.0	58.6	86.2	62.1	92.7	70.7	94.6	71.2	94.5	73.8	86.4	62.7	77.7	55.9
Luling	80.1	65.9	86.4	63.9	91.4	72.2	95.9	71.7	96.5	73.1	[a]88.8	[a]65.7	[e]81.8	[e]58.8
Orange	77.8	61.3	82.5	64.7	86.6	72.3	90.5	73.6	[a]89.1	[a]73.3	[a]85.9	[a]66.2	79.6	58.6
Palestine	77.7	61.3	80.0	61.9	87.2	70.8	[a]89.4	[a]72.4	89.3	71.8	84.2	62.8	79.7	56.0
Paris	[b]79.0	[b]57.0	[f]82.0	[c]55.7	[c]89.2	[b]69.2	[d]94.1	[d]71.9	92.0	71.6	84.9	62.1	75.9	51.6
San Antonio	78.1	63.1	82.9	64.9	87.8	70.8	93.1	71.8	93.1	72.5	84.8	66.1	81.2	60.3
Sour Lake	80.4	63.8	85.9	65.8	91.1	70.9	98.0	78.3	[a]88.4	[a]71.3	79.8	64.8	74.2	54.8
Tyler	81.0	58.0	85.6	59.9	94.3	69.0	91.9	70.4	91.1	71.3	84.9	62.3	78.0	54.2
Waco	79.6	62.6	83.6	62.7	91.0	71.3	95.1	72.8	94.6	73.1	87.8	65.1	79.7	57.4
Weatherford	80.9	58.2	82.6	59.8	90.0	70.5	92.5	70.0	92.8	65.2	84.3	59.9	77.5	50.1

APPENDIX 21.

Table of maximum and minimum temperature and annual range of temper-

Note.—Letters of the alphabet denote number of days missing from the record. Maximum and

States and stations.	January.		February.		March.		April.		May.		June.		July.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Alabama:	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Auburn	70	17	67	21	78	28	83	48	87	48	93	58	93	66
Bermuda	76	26	75	28	78	33	86	47	90	52	91	61	95	73
Carrollton	72	16	70	22	75	30	84	43	88	50	90	58	91	72
Citronelle	......	......	......	......	......	......	......	......	......	......	......	......	100	62
Decatur	......	......	......	......	......	......	90	37	96	38	98	49	99	58
Edwardsville	......	......	......	......	......	......	......	......	......	......	94	59	97	71
Eufaula	......	......	......	......	......	......	84	45	98	48	94	57	97	65
Evergreen	......	......	......	......	......	......	......	30	96	50	102	52	99	67
Florence	70	14	65	17	72	28	81	42	88	48	89	56	93	73
Fort Deposit	......	......	......	......	......	......	87	43	93	50	98	55	98	64
Gadsden	72	10	66	9	76	16	84	34	94	35	98	48	94	64
Greensborough	72	29	72	24	80	32	84	46	92	54	96	64	94	70
Greenville	75	18	73	24	81	33	87	50	96	58	97	70	......	......
Livingston (1)	......	......	......	......	......	......	d 87	d 41	92	45	99	50	99	65
Livingston (2)	74	20	72	28	81	82	84	44	91	50	93	52	95	75
Marion	......	......	......	......	......	......	87	42	92	47	96	54	100	68
Mobile	78	23	75	30	76	35	84	50	85	54	90	60	97	68
Montgomery	76	18	70	25	82	31	87	44	92	48	94	57	98	67
Mount Vernon B'ks	77	20	79	31	82	31	90	44	91	48	96	57	99	67
Mount Willing	......	......	......	......	......	......	......	......	......	......	96	54	98	64
New Market	69	19	62	12	74	30	80	42	82	44	86	50	89	71
Newton	78	25	79	31	83	31	89	56	96	58	......	......	......	......
Opelika	......	......	......	......	......	......	......	41	96	46	98	56	100	65
Pine Apple	......	......	......	......	......	......	87	41	94	41	98	50	100	65
Scottsborough	......	......	......	......	......	......	85	39	90	40	96	50	96	62
Selma (1)	......	......	......	......	......	......	......	......	a 94	a 45	95	52	a 97	a 71
Selma (2)	70	22	......	......	......	......	......	......	94	45	95	52	97	76
Talladega	69	10	66	20	77	25	83	43	93	41	92	49	93	64
Troy	......	......	73	28	82	55	89	50	91	62	93	68	97	73
Tuscaloosa	71	14	67	19	76	26	83	39	89	44	90	49	94	65
Tuscumbia (1)	......	......	......	......	......	......	87	41	90	34	93	50	100	61
Tuscumbia (2)	73	13	68	17	77	26	86	44	90	51	92	55	98	69
Union Springs	72	20	67	24	79	29	87	45	92	56	92	62	97	70
Uniontown	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Valley Head	72	12	69	10	78	20	84	42	87	50	92	58	94	67
Arizona:														
Apache, Fort	65	7	68	24	72	13	83	30	92	32	96	42	101	50
Benson	72	23	80	33	79	38	85	52	100	60	101	70	105	72
Bowie, Fort	64	24	65	30	70	30	80	40	91	47	95	60	98	62
Casa Grande	80	30	79	43	82	38	96	53	107	57	106	68	112	79
Globe	......	......	......	......	......	......	......	......	......	......	......	......	e 102	......
Grant, Fort	67	19	68	29	71	27	82	41	86	44	92	58	98	60
Holbrook	......	......	......	......	......	......	......	......	......	......	98	40	100	49
Huachuca, Fort	65	21	71	28	75	24	82	41	92	41	96	55	97	59
McDowell, Fort (1)	74	23	81	31	84	30	99	41	107	47	110	55	117	62
McDowell, Fort (2)	79	25	84	32	87	29	99	40	106	47	110	54	116	61
Maricopa	......	......	......	......	......	......	105	49	......	......	......	......	119	69
Mojave, Fort	73	14	79	25	86	27	103	41	104	38	109	49	114	52
Pantano	......	......	......	......	72	34	90	48	......	......	98	70	100	70
Phœnix	......	......	......	......	......	......	95	47	104	53	109	58	112	68
San Carlos Agency	70	20	74	30	a 80	a 29	b 92	b 36	102	42	107	54	114	60
San Simon	82	30	73	88	76	40	86	48	110	60	112	60	......	......
Texas Hill	79	24	85	36	90	40	106	52	......	......	......	......	118	82
Thomas, Fort	74	19	75	29	79	29	91	38	100	43	107	54	113	60
Tucson (1)	......	......	......	......	......	......	95	40	......	......	99	......	105	85
Tucson (2)	90	48	89	59	88	43	98	58	......	......	103	76	106	88
Verde, Fort	66	11	73	25	79	27	90	35	97	40	106	43	109	50
Whipple Barracks (1)	56	-12	63	22	69	5	78	31	85	34	89	87	96	46
Whipple Barracks (2)	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Wilcox (1)	79	11	76	22	79	17	89	32	96	35	100	43	104	51
Wilcox (2)	69	22	73	30	75	27	80	48	88	57	100	62	......	......
Williams	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Winslow	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Yuma	79	27	85	39	87	37	102	47	102	54	107	60	114	63
Do	76	34	......	......	86	44	99	60	102	66	105	77	109	80
Arkansas:														
Alexander	73	11	70	20	79	24	88	44	92	50	91	60	100	70
Brinkley	......	......	......	......	......	......	85	36	92	52	l 99	l 61	m 105	m 70

APPENDIX 21.

ature (*in degrees Fahrenheit*) *for* 1888, *compiled from all available sources.*

minimum temperatures at Pacific railway stations are not from self-registering instruments.

August.		September.		October.		November.		December.		Annual range.	Authority.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
°	°	°	°	°	°	°	°	°	°	°	
91	62	87	46	81	43	78	29	66	20	76	Signal Service.
95	72	90	52	82	41	78	27	71	19	76	State weather service.
93	74	84	46	81	42	79	30	....	....	....	Do.
97	64	93	49	91	46	87	30	73	23	....	J. G. Michael.
100	59	87	34	83	33	....	....	....	....	....	Signal Service.
96	66	....	....	78	40	76	33	....	....	....	State weather service.
94	62	89	43	87	43	....	....	....	....	....	Signal Service.
93	62	90	47	82	40	....	....	....	....	....	Do.
95	68	85	48	77	42	74	28	65	21	81	State weather service.
98	52	90	49	84	43	....	....	....	....	....	Signal Service.
92	57	87	35	80	36	78	28	63	19	89	State weather service.
96	70	88	54	83	46	79	30	68	30	72	Do.
....	....	....	....	....	....	....	....	....	....	....	Do.
100	65	92	45	84	40	....	....	....	....	....	Signal Service.
95	66	88	48	85	40	82	29	70	23	75	Prof. J. W. A. Wright.
98	65	88	44	82	42	....	....	....	....	....	Signal Service.
93	76	90	52	86	48	83	34	73	25	74	Do.
97	62	90	46	84	43	82	30	69	24	80	Do.
97	66	93	50	89	44	86	29	72	21	79	U. S. post hospital.
96	63	85	44	....	....	81	30	65	23	....	William M. Garrett.
92	64	83	40	77	38	75	31	66	12	80	Dr. George D. Norris.
....	....	....	....	....	....	....	....	....	....	....	State weather service.
99	60	88	42	82	40	....	....	....	....	....	Signal Service.
96	63	90	50	85	42	....	....	....	....	....	Do.
97	59	[c]87	[c]36	[c]81	[c]35	....	....	....	....	....	Do.
[c]97	62	91	48	[a]84	[a]41	....	....	....	....	....	Do.
97	73	....	....	84	41	....	....	61	30	....	State weather service.
96	57	87	40	77	37	76	26	66	18	86	Do.
94	71	84	54	85	51	82	33	78	25	....	Do.
96	64	85	44	78	38	79	25	68	18	82	Do.
98	60	89	38	80	35	....	....	....	....	....	Signal Service.
98	63	86	41	81	40	78	28	67	19	85	State weather service.
96	68	90	44	84	42	82	30	69	22	77	Do.
96	66	89	49	84	45	80	29	....	....	....	Do.
95	64	88	30	79	30	77	20	63	13	85	Do.
....	....	[e]93	[f]48	[g]87	30	71	19	69	18	....	Signal Service.
105	68	96	63	92	48	78	39	67	32	82	Pacific Railway system.
93	57	89	53	84	42	71	31	58	28	74	Signal Service.
112	78	....	....	100	63	91	50	75	40	....	Pacific Railway system.
99	....	97	....	89	....	76	....	64	....	....	J. H. Hamill.
96	60	91	53	87	38	73	30	62	30	79	Signal Service.
98	50	92	48	83	28	68	18	58	20	....	David Rope.
94	56	85	60	89	38	78	33	60	26	76	U. S. post hospital.
116	62	111	60	100	45	78	36	71	32	94	Signal Service.
116	62	104	68	104	40	82	85	74	31	91	U. S. post hospital.
....	....	....	....	88	58	....	....	81	39	....	Pacific Railway system.
113	47	114	59	102	44	83	40	68	32	100	U. S. post hospital.
....	....	97	60	88	52	74	38	71	37	....	Pacific Railway system.
109	65	103	64	....	....	91	48	....	....	....	Signal Service.
111	59	104	57	....	42	78	83	69	30	94	Do.
....	....	110	65	97	45	92	86	71	30	....	Pacific Railway system.
....	....	....	....	102	57	84	41	76	34	....	Do,
108	59	100	57	92	41	78	31	67	29	94	Signal Service.
102	....	103	65	98	....	85	38	....	....	....	E. L. Wetmore.
106	82	104	74	94	50	88	50	75	48	....	Pacific Railway system.
109	54	104	51	95	35	79	26	64	26	98	Signal Service.
94	48	90	46	84	29	64	24	58	18	108	Do.
....	....	83	52	84	29	64	24	58	18	....	U. S. post hospital.
101	48	97	42	94	31	80	18	69	22	93	Signal Service.
100	68	97	59	94	43	79	40	69	36	....	Pacific Railway system.
97	40	....	....	75	27	64	20	57	3	....	J. T. Ryan.
100	48	98	44	88	32	68	18	56	22	....	L. W. Roberts.
110	70	111	67	105	49	82	38	75	40	87	Signal Service.
....	....	....	....	96	57	....	....	70	42	....	Pacific Railway system.
100	64	88	49	80	32	80	27	64	16	89	State weather service.
105	60	....	....	....	....	....	....	....	....	....	Signal Service.

Table of maximum and minimum temperature and

States and stations.	January.		February.		March.		April.		May.		June.		July.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Arkansas—Continued.	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Conway	66	0	60	12	74	20	82	42	81	42	88	55	98	65
Devall's Bluff	......	......	......	......	......	......	86	37	89	41	95	49	98	59
Dallas	68	0	70	35	80	22	92	45	88	59	100	70	99	68
Dayton	......	......	......	......	......	......	......	......	86	60	91	62	98	74
Eureka Springs	73	— 8	70	7	82	15	86	34	84	41	93	52	......	......
El Dorado	......	......	......	......	......	......	......	......	......	......	91	48	94	60
Forrest City	......	......	......	......	......	......	84	48	86	55	94	60	97	56
Fort Smith	71	1	70	16	84	23	90	42	88	44	93	56	100	63
Galveston	68	23	72	40	75	42	78	56	86	62	90	69	91	74
Helena	75	7	71	21	79	28	86	48	91	46	95	50	99	63
Hot Springs	......	9	......	19	......	24	......	40	......	42	......	55	......	60
Heber	75	8	71	19	80	29	90	36	88	35	94	49	99	60
Little Rock	75	7	75	18	80	25	86	43	88	45	92	56	97	66
Lead Hill	74	— 2	73	11	90	18	94	36	93	37	103	52	111	58
Lonoke	......	......	72	28	80	31	85	43	94	48	91	62	99	66
Malvern	......	......	......	......	......	......	89	30	92	35	95	48	103	70
Monticello	......	......	......	......	......	......	89	31	92	32	96	54	98	61
Melbourne	......	......	......	......	......	......	......	......	98	36	......	......	......	......
Newport	......	......	......	......	......	......	91	40	92	41	102	50	105	64
Osceola	72	4	68	18	80	26	84	50	88	51	91	52	95	62
Ozone	......	......	......	......	......	......	......	......	......	......	86	55	94	66
Pine Bluff	......	......	......	......	......	......	87	43	93	41	97	56	99	64
Prescott	......	......	......	......	......	......	93	45	86	47	91	58	95	65
Portia	72	2	68	17	81	25	89	41	88	54	97	56	103	67
Russellville	......	......	......	......	82	21	90	40	90	41	95	53	100	63
Stuttgart	......	......	......	......	......	......	......	......	86	50	96	60	96	68
Texarkana	......	10	......	26	......	......	82	42	90	45	96	59	100	62
Washington	73	8	71	25	80	28	89	50	92	52	93	62	97	62
California:														
Alcade	......	......	......	......	......	......	......	......	......	......	......	......	*105	*68
Alcatraz Island	59	28	75	41	75	41	79	42	64	47	68	52	66	51
Almaden	65	27	75	38	75	40	84	45	85	52	90	60	95	58
Anaheim	78	34	77	48	74	44	92	52	88	58	87	60	93	62
Anderson	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Angel Island	61	27	80	40	78	39	94	45	77	49	82	54	95	52
Antioch	68	24	76	38	80	40	89	42	93	51	98	54	105	55
Aptos	64	19	75	34	67	38	80	40	68	45	82	53	88	50
Athlone	65	20	75	34	74	38	93	46	93	50	100	57	108	61
Auburn	64	12	77	28	76	33	89	42	86	46	94	52	101	54
Banning	74	22	78	32	76	32	91	38	87	43	98	49	103	54
Barstow	......	......	......	......	......	......	......	......	......	......	......	......	107	52
Beaumont	68	24	70	34	72	34	92	40	90	48	93	50	......	......
Berkeley	60	25	74	38	70	36	83	42	76	45	80	50	90	50
Benicia Barracks	60	24	74	38	71	40	84	46	83	50	90	56	97	57
Bidwell, Fort (1)	51	—26	62	11	66	6	81	24	87	28	82	32	92	39
Bidwell, Fort (2)	50	—25	63	14	66	8	85	26	93	30	87	36	96	40
Bishop Creek	54	3	74	36	70	35	90	48	96	58	104	58	105	70
Boca	......	......	......	......	51	5	......	......	85	30	81	38	......	......
Borden	69	17	82	33	75	35	98	45	100	55	103	59	......	......
Brentwood	58	19	71	35	80	35	90	41	92	55	95	67	......	......
Brighton	68	22	82	36	78	40	89	48	92	55	101	61	109	62
Byron	......	......	......	......	......	......	......	......	......	......	98	64	......	......
Caliente	70	20	......	......	68	32	94	40	......	......	94	57	102	66
Calistoga	63	22	80	32	......	......	......	......	80	40	90	49	103	48
Chico	62	18	80	35	80	40	95	45	98	55	100	60	......	......
Cisco	42	0	46	12	50	18	......	......	......	......	76	38	82	42
Coles	......	......	64	18	64	18	86	28	89	35	84	40	98	50
Colfax	60	16	70	35	......	......	84	38	78	47	97	50	102	54
Colton	......	......	......	......	......	......	102	44	100	52	102	56	110	62
Corning	58	25	70	36	62	36	96	50	90	55	97	55	108	69
Davisville	66	19	82	32	84	37	96	46	98	48	100	53	111	52
Delano	70	24	......	......	......	......	100	47	98	52	98	60	......	......
Delta	56	10	75	21	78	24	......	......	......	......	90	50	105	52
Dunnigan	65	20	74	40	80	46	96	50	90	60	105	67	114	62
Dunsmuir	......	......	......	......	82	*26	......	......	......	......	......	......	94	30
East Pasadena	70	28	73	38	78	36	98	43	......	......	......	......	......	......
Elmira	62	24	100	35	85	35	95	42	95	52	98	58	110	58
El Verano	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Emigrant Gap	47	8	58	21	59	25	76	29	......	......	76	38	86	50
Eureka	77	20	65	31	68	32	68	39	71	44	71	47	73	48
Farmington	65	20	82	32	76	39	91	51	94	55	102	58	......	......
Folsom	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Fort Jones	46	21	63	16	67	11	83	29	86	35	84	36	94	43
Fresno (1)	68	20	83	30	77	28	98	41	96	46	104	50	109	54
Fresno (2)	70	23	......	......	......	......	......	......	......	......	98	54	108	65
Galt	65	20	66	32	73	33	86	49	86	52	96	60	......	......
Gaston, Fort	65	5	75	20	82	22	92	27	91	31	87	37	104	37

annual range of temperature, etc.—Continued.

August.		September.		October.		November.		December.		Annual range.	Authority.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
°	°	°	°	°	°	°	°	°	°	°	
98	64	92	49	84	88	80	30	75	22	98	State weather service.
99	59	89	42	82	82	....	....	....	....	....	Signal Service.
94	61	85	63	72	46	66	29	....	....	....	State weather service.
99	72	90	65	86	88	78	21	65	20	....	Do.
....	....	....	....	....	....	....	....	68	28	....	Arthur H. Foote.
94	64	86	45	....	....	79	30	66	19	....	State weather service.
97	60	91	56	83	42	76	34	70	31	....	Signal Service.
100	64	93	48	84	34	79	28	68	22	99	J. Titcomb.
94	71	87	65	85	54	82	42	71	40	71	Do.
98	61	88	47	81	39	78	25	64	18	92	State weather service.
92	53	....	45	....	82	....	27	....	25	....	U. S. post hospital.
98	51	89	40	84	33	76	26	67	15	91	State weather service.
97	63	89	50	82	37	81	32	69	23	90	Signal Service.
110	56	97	40	90	31	87	25	65	16	113	Silas C. Turnbo.
96	64	91	50	79	39	77	30	70	22	....	State weather service.
103	58	90	60	....	....	....	....	....	....	....	Signal Service.
98	62	94	45	84	40	....	....	....	....	....	Do.
....	....	....	....	83	31	76	34	....	....	....	State weather service.
101	57	....	....	83	37	....	....	....	....	....	Signal Service.
98	58	88	43	81	38	....	....	....	....	....	State weather service.
92	61	86	49	78	39	72	30	62	20	....	Do.
100	53	....	....	....	....	....	....	....	....	....	Signal Service.
96	66	86	50	80	37	75	38	78	42	....	Do.
101	60	95	43	88	32	80	24	61	16	101	State weather service.
100	[d]60	90	41	80	35	....	....	....	....	....	Signal Service.
96	57	87	43	86	35	78	25	65	16	....	State weather service.
102	67	97	47	87	36	85	32	73	21	....	Signal Service.
95	67	88	49	83	35	83	32	67	20	89	State weather service.
....	....	108	62	95	48	75	38	66	35	....	Pacific Railway system.
66	48	64	54	81	50	69	46	61	42	40	U. S. post hospital.
102	55	94	58	88	50	73	39	65	43	75	Pacific Railway system.
86	62	94	59	86	59	76	52	76	44	60	Do.
112	68	104	70	90	46	77	31	69	33	....	Dr. A. Fouch.
78	53	79	....	91	....	82	....	67	....	....	U. S. post hospital,
105	58	102	57	98	47	72	32	63	39	89	Pacific Railway system.
80	50	78	50	82	42	72	32	70	40	69	Do.
109	62	107	58	95	45	74	36	65	36	89	Do.
....	....	103	54	91	46	74	35	69	32	....	Do.
104	54	105	58	102	50	81	38	74	36	83	Wellwood Murray.
....	....	106	55	95	43	73	28	67	24	....	George A. Gooding.
104	56	102	58	96	46	72	36	70	38	....	Pacific Railway system.
84	51	83	52	87	47	73	44	60	38	65	Prof. Fred. Soulé.
95	56	84	58	90	48	72	36	62	37	73	U. S. post hospital.
95	40	93	36	79	22	....	....	....	....	....	Signal Service.
97	42	84	52	81	26	60	11	56	12	122	U. S. post hospital.
....	....	102	64	92	40	75	28	56	23	....	Pacific Railway system.
95	38	87	35	74	18	52	8	48	10	....	Do.
....	....	....	....	....	....	....	....	60	35	....	Do.
....	....	101	66	89	49	67	29	58	39	....	Do.
109	62	107	62	93	50	81	40	62	35	87	Do.
108	66	102	58	94	48	74	28	60	34	....	Do.
....	....	....	....	94	47	74	40	68	30	....	Do.
....	....	108	50	89	34	77	29	68	33	....	Do.
....	....	....	....	90	45	73	37	64	35	....	Do.
....	....	....	....	70	28	....	....	43	20	....	Do.
100	49	94	42	84	33	70	23	59	24	....	Do.
100	58	102	55	88	44	70	34	65	34	....	Do.
....	....	110	62	104	50	90	42	94	30	....	Do.
110	70	106	60	105	52	70	44	63	43	85	Do.
108	50	108	47	93	47	78	36	69	38	92	Do.
105	67	....	....	....	....	88	43	68	38	....	Do.
104	57	....	....	85	40	73	30	67	37	....	Do.
109	60	106	59	90	53	73	38	59	39	94	Do.
98	33	....	....	98	45	79	35	65	30	....	Do.
....	....	....	....	....	....	....	....	74	43	....	A. L. Downing.
113	60	113	60	104	45	80	38	70	40	89	Pacific Railway system.
....	....	97	50	90	42	74	34	63	40	....	Do.
86	48	86	45	78	36	58	31	56	27	78	Do.
68	49	73	46	67	40	70	35	66	38	53	Signal Service.
....	....	111	60	98	44	80	33	59	35	....	Pacific Railway system.
....	....	....	....	85	50	....	....	64	40	....	Do.
94	45	92	40	79	32	57	23	55	26	80	J. Titcomb.
111	56	111	54	94	41	78	35	66	35	91	Signal Service.
108	65	108	64	96	39	92	38	71	38	....	Pacific Railway system.
108	62	....	....	92	44	76	38	57	36	....	Do.
101	40	90	43	87	27	60	24	61	29	99	U. S. post hospital.

Table of maximum and minimum temperature and

States and stations.	January.		February.		March.		April.		May.		June.		July.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
California—Continued.	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Georgetown	63	11	71	25	71	24	83	36	82	40	90	41	99	46
Gilroy	65	20	76	34	74	36	89	46	90	50	93	58	104	51
Goshen	70	16	84	30	80	34	97	48	99	58	102	60	110	65
Hollister	68	21	85	34	80	35	93	48	90	48	95	52	102	50
Hornbrook	48	—12	64	18	70	26	93	31	100	45	99	48	104	50
Hydesville	......	18	65	26	......	28	70	34	81	38	76	41	85	51
Indio	75	22	......	......	96	40	109	53	102	57	108	72	......	......
Ione	68	17	72	29	76	32	90	40	100	46	103	58	106	50
Iowa Hill	......	......	74	28	74	31	87	40	86	46	87	49	99	55
Keeler (1)	58	12	69	31	70	28	83	38	88	42	96	53	96	57
Keeler (2)	58	12	69	30	72	27	86	39	88	41	96	48	98	54
Keene	67	16	67	30	70	34	87	41	92	48	92	51	97	55
King City	71	15	78	29	73	30	100	38	93	45	100	55	110	52
Kingsburgh	58	20	75	32	77	38	93	46	......	......	92	60	112	62
Knight's Landing	60	20	64	35	73	40	86	42	85	49	95	50	105	59
Lathrop	64	23	79	34	74	34	90	44	92	40	95	55	......	......
Lemoore	71	18	76	34	76	30	90	44	86	52	91	60	99	66
Lewis Creek	70	24	77	36	74	34	100	48	97	52	104	62	106	60
Livermore	69	20	89	32	80	36	94	43	90	48	91	54	106	48
Livingston	68	21	......	......	......	......	92	49	94	54	100	60	......	......
Los Angeles (1)	74	28	78	40	78	38	104	50	82	54	90	59	95	60
Los Angeles (2)	71	31	74	39	79	36	99	44	83	45	94	50	95	49
Los Gatos	64	20	72	36	71	34	87	39	88	41	97	48	100	49
Mammoth Tank	85	27	......	......	......	......	......	......	105	55	111	70	......	......
Martinez	68	20	76	36	66	36	......	......	72	48	86	56	94	56
Marysville	73	20	......	......	......	......	90	50	......	......	100	60	106	66
Mason, Fort	62	30	72	44	65	43	77	48	68	50	78	57	82	53
Menlo Park	64	20	76	34	76	36	88	42	88	50	90	56	101	52
Merced	72	20	80	32	76	32	96	42	96	48	102	58	110	58
Modesto	65	19	75	35	76	35	91	45	94	50	102	52	110	58
Mojave	75	16	78	33	......	......	96	48	......	......	......	......	105	62
Montague	......	......	67	32	72	40	88	45	91	50	88	53	100	66
Monterey	63	20	72	43	66	43	77	47	72	52	78	58	90	58
Mount Hamilton	......	......	......	......	......	......	......	......	......	......	......	......	90	40
Napa	65	21	......	......	73	30	86	38	83	44	95	52	100	48
Needles	......	......	......	......	......	......	......	......	......	......	......	......	113	71
Newark	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Newhall	73	14	82	30	82	33	95	42	90	50	99	54	102	57
Nicolaus	65	18	79	35	81	38	93	46	91	54	92	56	104	57
Niles	......	......	70	39	76	40	88	47	......	......	......	......	......	......
Nordhoff	68	24	79	37	76	32	98	43	85	50	......	......	......	......
Oakland (1)	61	26	76	39	71	38	82	44	73	50	80	53	91	52
Oakland (2)	62	28	66	40	62	38	70	44	70	48	70	56	80	54
Orland	60	22	78	38	74	36	97	44	......	......	104	57	115	62
Oroville	65	20	79	34	78	40	87	45	90	51	93	57	102	56
Pajaro	67	20	74	32	70	35	82	40	70	43	74	54	81	56
Paso Robles	67	13	75	25	76	23	94	36	98	44	102	55	106	53
Petaluma	60	18	......	......	68	39	......	......	......	......	85	40	......	......
Placerville	......	......	......	......	......	......	......	......	......	......	......	......	97	[a]55
Pleasanton	70	22	......	......	80	38	......	......	......	......	......	......	104	62
Presidio of San Francisco.	64	32	78	34	73	35	84	38	72	41	74	47	87	53
Red Bluff (1)	68	16	80	38	......	......	100	44	104	52	102	55	114	60
Red Bluff (2)	60	18	82	34	78	32	93	41	96	48	99	49	109	54
Redding	60	18	76	34	78	31	90	47	100	52	......	......	106	57
Riverside (1)	74	26	78	33	76	32	98	38	86	46	95	48	100	44
Riverside (2)	[b]73	[b]25	80	32	79	32	100	37	88	44	99	48	104	47
Rocklin	65	20	......	......	78	35	86	40	88	50	100	55	105	59
Rumsey	......	......	......	......	......	......	......	......	......	......	......	......	108	58
Sacramento (1)	63	19	75	34	76	37	89	43	90	46	96	48	104	51
Sacramento (2)	64	16	72	28	74	30	87	36	89	41	96	44	100	48
Sacramento (3)	62	22	66	38	68	39	81	46	84	53	......	......	93	60
Salinas (1)	62	21	72	30	68	33	80	42	68	50	80	58	87	54
Salinas (2)	63	22	74	35	70	30	79	42	74	51	75	51	81	54
San Ardo	69	20	78	30	73	32	91	44	92	48	96	55	108	51
San Diego	64	33	67	42	72	41	93	47	70	52	76	54	77	55
San Fernando	......	......	......	......	......	......	......	......	95	49	104	54	102	58
San Francisco	63	29	76	42	74	38	88	46	81	47	80	53	93	51
Sanger Junction	......	......	......	......	......	......	......	......	......	......	......	......	......	......
San José	65	22	78	35	75	38	86	44	82	48	88	54	96	51
San Luis Obispo	67	25	75	38	73	32	95	40	74	49	95	49	88	47
San Mateo	64	26	72	40	72	40	84	50	70	50	80	60	92	60
San Miguel	67	17	80	30	77	27	90	32	93	48	95	55	100	53
San Pedro	......	......	......	......	......	......	......	......	......	......	......	......	84	70
Santa Barbara (1)	63	30	70	40	......	......	90	48	72	52	82	60	......	......
Santa Barbara (2)	66	28	58	49	75	38	95	43	72	52	82	50	86	52

annual range of temperature, etc.—Continued.

August.		September.		October.		November.		December.		Annual range.	Authority.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
°	°	°	°	°	°	°	°	°	°		
104	46	....	....	84	44	72	34	68	32	....	C. M. Fitzgerald.
103	54	103	50	94	40	78	30	66	34	84	Pacific Railway system.
110	67	110	60	96	46	78	32	62	33	94	Do.
104	48	90	46	80	40	74	31	79	36	83	Do.
....	....	101	46	89	31	....	....	62	20	....	Do.
77	43	82	43	75	36	70	30	65	35	67	E. T. Foss.
....	....	112	75	....	....	98	44	80	32	....	Pacific Railway system.
110	58	108	54	88	38	80	30	80	34	93	Do.
102	60	102	61	90	46	74	38	....	....	....	C. F. Macy.
100	61	....	....	85	48	68	35	56	32	....	Pacific Railway system.
100	60	96	59	85	47	70	32	56	30	88	Signal Service.
100	64	102	52	86	41	78	32	66	29	86	Pacific Railway system.
103	51	103	50	98	37	80	30	75	34	95	Do.
114	68	112	62	....	....	78	36	62	33	....	Do.
....	....	102	56	92	45	78	37	63	35	....	Do.
112	50	105	40	95	40	85	30	75	33	....	Do.
113	64	108	60	93	45	72	35	68	37	95	Do.
106	64	110	62	93	49	76	40	63	38	86	John Tuohy.
110	50	....	....	90	38	78	29	64	30	....	Pacific Railway system.
111	60	105	57	93	44	78	35	60	39	....	Do.
93	60	97	60	94	50	80	44	77	41	76	Do.
97	51	98	55	98	44	84	40	79	41	67	Signal service.
98	51	[a]100	[a]41	....	....	71	39	64	42	80	D. Vandenburg.
114	83	113	80	103	62	83	45	75	40	....	Pacific Railway system.
86	51	92	51	87	48	77	39	72	37	74	Do.
105	60	....	....	77	50	70	37	60	40	....	Do.
70	38	70	53	76	49	70	48	64	43	52	United States post hospital.
96	54	91	50	85	40	72	33	63	38	81	Pacific Railway system.
120	60	110	54	94	44	78	40	68	36	100	Do.
109	58	109	62	92	45	80	37	62	37	91	Do.
....	....	....	....	93	50	....	....	87	34	....	Do.
....	....	95	60	90	37	67	25	65	23	....	Do.
75	56	74	54	75	44	71	31	70	40	70	Do.
93	46	91	48	78	40	69	34	62	31	....	Lick Observatory.
....	....	....	....	85	39	79	32	63	34	....	Pacific Railway system.
116	65	111	63	100	46	83	45	68	32	....	John J. Clarke.
....	....	92	54	90	45	75	38	62	38	....	Pacific Railway system.
107	54	108	56	100	45	80	30	74	30	94	Do.
105	56	106	58	90	44	78	31	65	36	88	Alvah Pendleton.
....	....	90	50	89	42	84	36	68	38	....	Pacific Railway system.
....	....	....	....	99	45	83	39	73	35	....	R. Robinson.
86	52	74	54	82	46	73	41	63	41	65	Dr. J. B. Trembly.
78	54	70	54	74	47	66	41	66	40	52	Pacific Railway system.
....	....	....	....	98	53	79	40	65	42	....	Do.
102	58	102	57	89	45	76	38	66	35	82	Hiram Arents.
80	48	78	54	89	40	71	52	71	43	69	Pacific Railway system.
108	52	104	50	94	35	83	24	66	28	95	Do.
....	....	86	52	89	42	....	....	60	37	....	Do.
....	....	102	53	86	40	72	32	64	29	....	Do.
....	....	....	....	84	43	66	33	63	36	....	Do.
74	48	67	51	88	43	73	39	69	38	55	U. S. post hospital.
118	65	112	58	95	22	79	40	78	38	102	Pacific Railway system.
108	55	106	55	92	44	73	36	61	35	91	Signal Service.
....	....	....	....	95	46	62	33	77	34	....	Pacific Railway system.
102	51	102	54	98	43	79	36	....	....	....	A. K. Holt.
104	50	105	52	99	43	79	37	73	33	80	W. E. Keith.
106	59	103	61	93	45	70	38	58	33	....	Pacific Railway system.
....	....	108	55	95	50	78	38	68	38	....	Do.
[a]108	51	106	50	92	40	75	32	63	36	89	Signal Service.
100	48	98	48	82	37	71	28	63	30	84	S. H. Gerrish.
94	58	93	56	79	46	66	37	65	38	....	Pacific Railway system.
72	52	68	44	80	40	67	32	65	40	66	Do.
76	52	74	47	82	40	77	31	67	38	62	Dr. E. K. Abbott.
104	50	111	51	96	45	76	35	68	36	91	Pacific Railway system.
82	57	82	58	80	53	75	46	73	44	60	Signal Service.
104	58	108	58	102	52	82	32	76	32	....	Pacific Railway system.
85	51	88	50	87	50	74	47	65	43	64	Signal Service.
....	....	112	59	96	55	80	30	72	35	....	Pacific Railway system.
98	54	93	55	89	43	74	38	65	39	76	Do.
96	49	93	46	96	36	77	39	73	42	71	J. E. Lewis.
90	56	84	52	81	44	62	36	59	38	66	Pacific Railway system.
106	53	106	51	92	40	75	32	65	32	89	Do.
....	....	90	65	90	58	78	48	75	47	....	Do.
80	60	82	50	78	48	76	44	70	42	....	Do.
84	52	88	53	95	50	79	45	....	....	....	H. D. Vail,

Table of maximum and minimum temperature and

States and stations.	January.		February.		March.		April.		May.		June.		July.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
California—Continued.	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Santa Cruz	62	24	78	38	77	38	86	41	78	48	90	55	98	52
Santa Maria	65	23	71	32	70	29	95	40	81	46	88	34	89	48
Santa Monica	75	39	79	48	......	......	85	52	80	52	79	56	91	63
Santa Rosa	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Selma	69	22	80	31	73	29	92	44	91	50	100	65	108	68
Sims	......	......	......	......	85	30	99	40	99	49	97	50	104	60
Sisson	......	......	......	......	65	30	85	45	......	......	......	......	......	......
Soledad	76	16	74	30	74	30	93	40	80	42	90	46	104	46
Sonoma	d 58	d 20	b 84	b 35	81	34	......	......	......	......	c 88	c 47	......	......
Soquel	68	18	78	32	72	34	84	44	82	46	88	58	94	52
South Side	76	26	78	30	80	28	98	44	88	48	98	52	100	60
South Vallejo	58	24	......	......	65	43	70	45	73	50	88	53	95	54
Spadra	70	27	78	30	82	38	102	44	82	50	......	......	......	......
Steeles	63	21	71	35	72	34	84	40	77	39	94	46	98	48
Stockton	60	24	72	33	74	34	84	46	82	51	......	......	102	54
Suisun	61	27	80	37	82	40	100	48	90	49	95	52	104	57
Summit	37	—12	44	10	45	13	60	22	66	30	70	34	76	38
Sumner	73	20	80	39	78	35	96	54	100	57	102	68	109	68
Tehachapi	58	2	60	30	......	......	......	......	82	40	......	......	......	......
Tehama	62	21	80	32	81	38	90	45	......	......	95	55	110	64
Templeton	73	15	85	30	83	24	97	40	95	45	98	55	105	53
Towles	58	8	70	26	70	28	88	32	87	36	86	44	95	42
Tracy	66	20	72	35	78	38	93	42	92	52	95	60	103	58
Traver	......	......	......	......	......	......	90	45	95	58	98	68	106	70
Tropico	72	26	75	36	82	38	102	46	85	57	100	58	95	60
Truckee	46	—30	48	10	......	......	77	22	......	......	82	36	87	46
Tulare	63	18	76	31	69	43	98	52	99	57	106	60	110	59
Turlock	70	21	80	35	84	35	92	46	96	52	100	57	106	60
Upper Mattole	62	17	83	27	80	27	91	36	98	40	80	50	98	40
Vacaville	60	22	......	......	78	39	90	44	92	55	98	58	106	59
Valley Springs	......	......	......	......	......	......	......	......	......	......	......	......	96	66
Walnut Creek	a 66	a 18	76	31	87	32	h 94	f 36	a 96	a 40	a 101	a 47	111	50
Westport	62	26	60	31	64	36	65	42	66	45	78	49	76	44
Wheatland	64	19	78	33	77	37	91	42	92	49	97	49	106	52
Williams	72	19	80	32	80	33	93	38	92	48	100	64	110	62
Willows (1)	63	17	78	28	78	32	93	35	100	43	107	43	111	49
Willows (2)	60	20	76	33	75	33	98	44	98	52	96	58	100	60
Winters	......	......	......	......	......	......	......	......	......	......	......	......	105	65
Woodland	67	18	61	35	63	36	71	38	79	47	92	50	101	52
Colorado:														
Akron	......	......	......	......	73	—10	89	18	......	......	101	47	......	......
Alma	......	......	41	— 6	49	—17	59	5	63	19	76	23	79	34
Bennett	......	......	70	20	80	10	94	32	95	30	114	60	115	65
Breckenridge	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Buena Vista	......	......	......	......	......	......	......	......	76	28	......	......	......	......
Burlington	......	......	......	......	......	......	......	......	......	......	......	......	103	50
Cañon City	......	......	......	......	75	— 1	86	32	88	34	101	42	100	46
Castle Rock	......	......	......	......	......	......	80	18	......	......	......	......	......	......
Colorado Springs	63	—23	64	10	73	1	80	27	77	31	95	38	96	47
Como (near)	47	—16	44	4	51	— 7	62	16	62	20	79	29	83	41
Coulter	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Delta	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Denver	76	—20	70	16	70	— 2	81	30	85	32	98	41	100	51
Dolly Varden Mine	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Fort Collins	71	—28	68	11	79	3	91	30	81	30	......	......	......	......
Georgetown (1)	......	......	......	......	......	......	64	19	69	27	82	36	84	46
Georgetown (2)	52	—18	47	9	58	— 2	64	19	69	27	82	36	84	46
Glenwood Springs	......	......	......	......	......	......	85	26	92	32	......	......	105	42
Grand Junction	50	—20	66	19	72	12	92	31	......	......	......	......	......	......
Greeley	70	—34	70	9	75	— 8	......	......	......	......	......	......	99	50
Hartsel	......	......	......	......	......	......	68	11	68	20	82	28	......	......
Home	......	......	56	3	63	— 4	79	12	82	21	94	30	93	37
Husted	64	—34	63	4	74	— 7	81	21	79	31	96	37	98	44
Idaho Springs	......	......	......	......	......	......	......	......	76	28	88	37	90	41
Julesburg	......	......	......	......	......	......	......	......	80	27	99	43	104	45
Las Animas	71	—18	72	14	79	6	88	31	87	35	......	......	......	......
Leadville	......	......	......	......	......	......	......	......	......	......	81	27	86	37
Lewis, Fort	55	—28	50	— 8	58	—10	71	12	78	26	83	31	90	40
Longmont	......	......	......	......	......	......	88	27	89	27	100	42	99	51
Lyon, Fort	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Monte Vista	50	—23	58	—14	66	3	......	......	......	......	92	30	96	41
Montrose	54	—20	57	16	66	7	76	29	81	32	92	37	97	46

annual range of temperature, etc.—**Continued.**

August.		September.		October.		November.		December.		Annual range.	Authority.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
°	°	°	°	°	°	°	°	°	°	°	
88	55	82	56	92	45	75	37	71	42	74	Pacific Railway system.
90	46	83	47	97	38	80	34	76	33	74	L. E. Blochman.
89	62	84	64	78	57	76	44	78	42	....	Pacific Railway system.
....	....	95	53	85	35	81	32	69	36	....	Do.
....	....	....	....	93	47	80	35	60	35	....	Do.
105	60	104	60	92	60	81	30	55	30	....	Do.
92	53	90	42	76	35	59	25	61	22	....	Do.
96	48	90	50	96	36	80	30	74	32	8›	Do.
....	....	°101	°48	91	37	78	32	....	....	....	Robert Hall.
86	50	80	50	86	40	70	30	70	42	76	Pacific Railway system.
108	58	110	64	84	48	78	36	78	36	84	Do.
93	53	86	55	83	45	78	40	68	37	....	Do.
92	52	....	....	80	50	....	....	....	....	....	Do.
[a]88	[a]46	84	48	96	45	77	40	72	39	77	A. T. Mason.
100	58	....	....	88	47	70	38	58	42	....	Pacific Railway system.
10.)	58	105	57	92	45	....	....	71	39	....	Do.
81	42	76	40	70	29	....	....	42	12	....	Do.
110	74	108	66	91	48	....	....	....	....	....	Do.
....	....	85	55	65	35	60	25	70	23	....	Do.
110	68	....	....	81	50	....	....	70	35	....	Do.
107	52	105	49	95	35	77	27	67	31	92	Do.
92	40	92	40	78	40	65	32	60	30	87	Do.
106	60	101	57	87	50	75	40	65	40	86	Do.
102	68	102	64	95	54	....	....	58	30	....	Do.
102	58	102	58	100	42	83	37	77	36	76	Do.
88	46	....	....	76	82	66	16	50	12	....	Do.
113	53	113	60	92	46	79	42	60	34	95	Do.
109	63	106	60	92	47	74	36	67	45	88	Do.
91	45	105	42	90	36	78	30	....	....	....	W. N. Roscoe.
110	60	106	58	96	48	76	84	65	38	....	G. O. Coburn.
....	....	105	61	88	52	....	....	65	37	....	Pacific Railway system.
112	40	111	50	104	43	102	35	89	34	94	A. L. Bancroft.
78	45	77	45	74	43	....	....	....	....	....	E. S. S. Root, M. D.
107	53	109	53	90	42	77	32	60	35	90	W. M. Lumbard.
109	62	110	62	89	53	76	40	62	40	91	Pacific Railway system.
109	48	109	52	93	40	74	33	68	34	94	David Bentley.
....	....	105	65	90	55	70	34	56	37	....	Pacific Railway system
....	....	107	62	95	51	78	40	68	40	....	Do.
102	52	....	....	88	44	84	32	72	38	....	Do.
....	....	88	30	....	....	....	....	....	....	....	State weather service.
75	29	69	23	59	10	51	— 4	49	— 6	....	Do.
....	....	....	....	....	....	....	....	....	....	....	I. S. Putnam.
....	....	....	....	72	—8	70	—17	80	—14	....	State weather service.
....	....	....	....	....	....	....	....	....	....	....	Do.
100	44	92	32	77	....	....	....	....	....	....	Do.
99	52	95	40	81	26	74	18	67	15	....	Do.
....	....	....	....	....	....	74	10	65	0	....	Do.
92	45	87	37	75	22	68	12	64	7	119	Signal Service.
77	33	72	29	58	15	52	1	46	2	99	State weather service.
....	....	....	....	....	....	....	....	56	—16	....	Jesse E. Glick.
....	....	97	35	86	24	59	14	46	8	....	J. A. Curtis.
92	49	90	38	80	26	70	12	68	7	120	Signal Service.
60	15	....	....	41	8	37	— 7	35	— 5	....	State weather service.
....	....	89	40	72	24	70	13	68	4	....	Prof. L. G. Carpenter, Elwood Mead, and V. E. Stolbrand.
78	44	74	36	63	24	54	7	52	10	....	W. A. Jayne, M. D.
78	44	74	36	60	24	54	7	49	10	102	State weather service.
100	44	93	37	84	24	68	16	52	— 2	....	Do.
....	....	....	....	....	....	....	....	....	....	....	Frank McClintock.
89	43	....	....	73	21	63	11	66	3	....	E. Bethel.
....	....	....	....	....	....	....	....	....	....	....	State weather service.
87	32	....	....	....	....	....	....	....	....	....	Do.
93	40	88	33	76	17	69	9	62	4	132	Do.
85	41	82	32	71	24	66	5	62	7	....	Do.
99	42	98	31	80	17	....	....	....	....	....	Do.
....	....	....	....	....	....	....	....	....	....	....	Signal Service.
76	32	70	28	59	16	49	0	48	— 3	....	State weather service.
88	41	83	40	72	22	58	5	56	— 1	118	U. S. post hospital.
91	42	90	31	80	20	....	5	69	3	....	State weather service.
....	....	98	37	85	19	77	7	68	6	....	U. S. post hospital.
92	37	83	30	72	16	58	5	39	— 6	....	State weather service.
93	46	88	40	78	25	57	17	46	9	117	Signal Service.

Table of maximum and minimum temperature and

States and stations.	January.		February.		March.		April.		May.		June.		July.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Colorado—Continued.	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Morgan, Fort	......	—36	67	10	79	—12	92	23	......	......	......	......	......	......
Ouray	......	......	......	......	......	......	......	......	......	......	......	32	89	40
Pandora	59	—22	70	0	70	— 8	72	21	75	21	86	25	91	30
Pike's Peak	25	—23	26	—11	28	—12	38	2	40	7	58	18	62	32
Pueblo (1)	......	......	......	......	......	......	......	......	......	......	......	......	103	51
Pueblo (2)	......	......	......	......	77	5	84	34	86	36	102	46	103	51
Rocky Ford	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Saguache	......	—15	......	8	......	......	......	......	......	27	......	32	......	42
Thon	......	......	......	......	......	......	80	18	83	26	......	......	......	......
Walden	......	......	......	......	......	......	75	10	75	10	80	18	87	27
Connecticut:														
Canton	40	— 9	48	—11	58	2	84	20	83	26	97	42	92	44
Colchester	55	— 8	56	— 5	54	8	82	20	83	26	......	......	......	......
Hartford	51	—20	48	—10	53	0	87	19	83	32	99	51	88	52
Mansfield	......	......	......	......	......	......	......	......	......	......	94	41	87	50
Middletown	55	—14	50	— 7	56	4	88	22	85	30	100	42	90	49
New Hartford	43	—17	42	—14	48	— 2	80	20	79	28	99	43	90	52
New Haven	53	— 4	49	— 2	55	5	78	25	80	32	94	48	90	51
New London	56	— 3	50	— 1	58	12	68	26	77	36	92	50	86	54
Shelton	52	— 7	45	2	52	6	81	25	79	33	96	40	86	46
Southington	48	—19	53	— 5	56	3	90	21	84	38	97	53	88	57
Thompson	52	—11	48	— 8	51	6	84	18	77	29	92	43	85	49
Voluntown	55	—16	53	— 6	54	10	75	25	84	40	102	47	92	58
Waterbury	50	—14	50	— 6	59	2	85	22	80	26	96	38	91	44
Dakota:														
Abraham Lincoln, Fort	45	—36	47	—33	47	—21	84	7	76	18	98	34	97	50
Bismarck	40	—37	46	—31	47	—20	81	6	74	20	95	31	96	49
Brookings	......	......	......	......	......	......	......	......	......	......	95	34	101	42
Buford, Fort	42	—49	49	—28	51	—28	82	4	75	22	100	36	95	49
Davenport	......	......	......	......	......	......	76	24	72	21	97	31	97	48
Gallatin	......	......	42	—48	......	......	66	— 2	76	20	......	......	90	50
Garden City	40	—35	47	—31	40	—15	70	13	72	23	97	32	97	46
Grand View	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Highmore	......	......	51	—29	57	—17	......	......	......	......	......	......	104	51
Huron	40	—36	45	—32	50	—14	80	20	74	24	95	36	102	48
Kimball	45	—34	48	—26	54	—14	86	22	80	29	93	41	104	50
Long Creek	......	......	......	......	......	......	......	......	......	38	......	51	......	59
Meade, Fort	61	—34	59	—10	67	—17	84	22	75	31	96	35	98	51
New England City	......	......	......	......	......	......	......	......	......	......	......	......	97	42
Parkston	42	—28	52	—20	63	—12	82	20	78	30	96	40	102	55
Pembina, Fort	30	—51	38	—48	42	—30	76	4	80	15	95	30	94	44
Randall, Fort	46	—30	55	—20	59	—17	87	25	73	29	99	41	102	50
Rapid City	66	—30	59	— 3	66	—16	84	20	75	22	99	40	100	51
Richardton	41	—37	46	—25	48	—27	......	......	70	28	97	42	98	52
Sisseton, Fort	38	—38	40	—35	42	—15	70	2	70	14	95	39	100	49
Spring Lake	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Sully, Fort (1)	53	—31	63	—19	66	—13	89	23	82	30	100	39	106	51
Sully, Fort (2)	50	—32	57	—20	60	—13	83	22	74	30	99	38	104	52
Totten, Fort (1)	35	—41	38	—42	41	—22	74	— 1	76	22	93	30	88	46
Totten, Fort (2)	37	—40	40	—40	41	—21	76	1	79	22	92	30	89	48
Webster	43	—38	47	—38	50	—20	75	7	74	23	98	32	101	52
Woonsocket	......	......	......	......	......	......	84	16	80	22	99	35	107	45
Yankton	50	—28	56	—19	69	—18	85	24	79	32	95	43	102	54
Yates, Fort (1)	50	—32	47	—22	49	—18	83	12	76	24	100	35	102	51
Yates, Fort (2)	49	—34	50	—25	53	—28	82	18	79	28	98	34	101	50
Delaware:														
Newark	......	......	......	......	......	......	......	......	......	......	......	......	......	......
District of Columbia:														
Kendall Green	46	8	53	12	72	14	85	34	87	46	......	......	107	50
Rock Creek Bridge	55	10	61	14	79	11	94	37	98	50	98	55	95	64
Washington Reservoir (rec.).	52	8	58	10	72	8	86	38	89	44	98	56	91	61
Washington Reservoir (dis.).	52	8	57	15	72	13	87	13	89	40	96	55	91	60
Washington	54	9	61	13	76	10	89	32	89	39	94	52	94	56
Florida:														
Altamonte	82	32	83	35	86	40	88	56	......	......	94	64	98	71
Alva	82	37	84	43	86	40	86	62	90	64	93	67	92	71
Archer	85	22	82	32	90	32	94	42	97	52	104	55	102	65
Cedar Keys	77	29	73	33	74	37	81	55	86	63	89	66	91	71
Duke	80	32	78	32	87	39	88	58	88	58	93	65	......	......

annual range oj temperature, etc.—Continued.

August.		September.		October.		November.		December.		Annual range.	Authority.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
°	°	°	°	°	°	°	°	°	°		
....	....	....	....	....	....	....	....	....	....	....	State weather service.
85	42	83	37	73	25	52	12	51	8	....	Do.
....	....	....	....	....	....	....	....	....	....	....	Do.
56	26	49	23	....	....	....	....	....	....	....	Signal Service.
100	47	96	38	84	25	72	13	68	10	....	Do.
100	47	96	38	84	25	72	13	68	10	....	State weather service.
....	....	....	....	83	31	74	18	62	13	....	F. Watrous.
....	39	....	30	....	20	....	12	....	0	....	State weather service.
89	43	89	32	81	16	71	0	....	....	....	Do.
80	23	80	14	69	0	....	....	....	28	....	Do.
90	42	80	28	65	26	69	7	58	3	108	New England Meteorological Society.
90	46	88	28	74	28	70	11	59	6	....	Do.
92	45	73	28	63	28	61	8	56	6	119	William R. Matson.
88	44	78	27	65	26	69	9	57	2	....	New England Meteorological Society.
91	46	77	31	66	28	68	10	58	6	114	Do.
90	44	79	28	62	27	64	6	53	— 2	116	Rev. William Goodwin.
91	50	78	32	66	80	67	11	54	5	98	Signal Service.
88	54	79	35	65	82	65	14	53	9	95	Do.
91	40	77	32	65	27	65	14	55	8	103	New England Meteorological Society.
92	48	81	31	67	25	70	9	57	4	116	Luman Andrews.
87	48	78	30	67	28	68	8	56	3	103	New England Meteorological Society.
94	52	78	31	66	33	67	13	56	6	118	Rev. E. Dewhurst.
94	39	80	26	66	24	72	7	62	0	110	New England Meteorological Society.
102	36	94	27	80	16	60	0	59	— 6	138	U. S. post hospital.
98	36	93	29	79	20	59	0	57	— 5	135	Signal Service.
94	40	93	23	82	21	67	2	58	— 5	....	Dakota Agricultural College.
96	36	93	25	76	22	54	1	58	— 9	149	Signal Service.
95	34	88	25	79	17	58	— 4	48	— 4	....	J. W. Leech.
....	....	86	20	82	14	54	0	48	—10	....	S. J. Pound.
95	43	84	29	77	19	58	3	55	— 4	132	W. C. T. Newell.
....	....	....	....	84	27	87	16	68	18	....	Joseph F. Angus.
98	42	....	....	....	....	....	....	....	....	....	W. R. McDowell.
96	42	88	29	79	17	66	8	63	— 7	138	Signal Service.
94	51	90	30	76	20	60	10	62	— 1	138	A. S. Stuver.
....	54	....	43	....	....	....	....	....	....	....	Elizabeth Ingalls.
90	40	90	35	75	15	55	— 8	55	0	132	U. S. post hospital.
93	39	93	17	75	13	65	— 4	62	— 8	....	Lewis A. Dodge.
97	48	....	....	....	....	78	2	65	— 2	....	John J. Swartz.
99	29	84	24	78	20	53	— 8	43	—14	150	U. S. post hospital.
100	42	94	25	90	20	72	4	68	4	132	Do.
91	42	94	35	79	21	68	10	68	— 4	130	Signal Service.
....	....	....	....	....	....	....	....	....	....	....	Professor A. Nordberg.
95	42	88	32	77	24	60	4	45	— 3	138	U. S. post hospital.
....	....	....	....	68	12	60	—12	56	— 8	....	A. Gould.
100	46	95	31	79	19	67	8	68	— 6	137	U. S. post hospital.
97	45	95	30	79	18	66	2	67	— 6	136	Signal Service.
94	35	87	29	78	19	59	— 3	54	— 5	136	Do.
95	35	87	31	81	21	59	— 3	54	— 5	139	U. S. post hospital.
97	42	89	27	81	22	69	0	61	— 9	139	Prof. Arthur Betts.
99	37	90	27	80	16	64	— 1	63	— 9	....	L. O. Libbey.
97	44	93	35	82	24	79	9	65	6	130	Signal Service.
101	43	95	25	82	21	59	8	64	— 6	134	Do.
99	41	95	27	80	18	59	— 1	63	—11	135	U. S. post hospital.
....	....	76	42	68	29	72	19	56	18	....	Prof. George A. Harter.
....	....	....	....	70	34	72	24	53	16	....	Deaf and Dumb Institution.
99	59	86	43	76	38	76	28	61	19	89	Washington Water Works.
95	57	80	41	71	37	74	24	57	18	90	Do.
97	56	81	44	69	38	73	24	57	17	89	Do.
97	52	84	39	75	35	75	24	61	16	88	Signal Service.
96	70	93	58	91	52	87	39	79	28	70	E. P. Tebeau.
94	71	93	66	96	55	88	34	81	29	67	Charles E. Robins.
101	67	100	52	94	42	94	29	82	23	82	Dr. J. C. Neal.
91	71	91	55	83	56	83	43	70	32	62	Signal Service.
96	74	91	51	91	54	....	....	....	....	....	Bennett P. Ferrill.

Table of maximum and minimum temperature and

States and stations.	January.		February.		March.		April.		May.		June.		July.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Florida—Continued.	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Fort Meade	83	36	85	43	88	38	88	59	91	65	94	74	97	76
Homeland	82	39	85	42	87	40	89	55	92	60	96	62	97	72
Jacksonville	81	28	82	32	84	35	88	49	93	56	96	64	98	68
Jupiter	83	45	85	47	83	45	88	59	88	62	89	68	94	69
Key West	81	58	80	59	82	58	82	64	85	66	89	73	90	68
Limona	84	36	86	40	89	43	89	60	93	61	96	70	......	......
Manatee	83	36	88	42	90	42	92	50	93	53	94	62	94	73
Matanzas	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Merritt's Island	80	40	82	42	84	44	89	61	89	64	94	68	96	72
Micco	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Pensacola	71	26	70	32	76	38	78	54	85	58	88	64	94	72
St. Francis Barracks	79	30	78	36	85	38	86	52	85	61	94	63	92	69
Tallahassee	78	25	75	30	83	31	88	52	91	57	92	66	93	71
Titusville	80	36	81	38	87	41	87	56	88	62	93	60	95	68
Georgia:														
Albany	......	......	......	......	......	......	89	48	94	53	97	51	[b]98	[b]70
Allapaha	......	......	......	......	......	......	[a]87	[a]43	93	51	96	55	98	65
Andersonville	77	18	......	......	......	......	......	......	......	......	......	......	100	65
Athens (1)	75	16	72	15	80	22	91	37	92	41	96	57	99	62
Athens (2)	......	......	......	......	......	......	91	37	96	40	100	55	102	62
Atlanta	71	15	68	13	77	24	84	40	88	44	93	55	94	65
Augusta	78	23	74	22	81	28	91	43	94	47	99	58	104	65
Bainbridge	......	......	......	......	......	......	87	45	94	52	96	61	97	70
Camak	......	......	......	......	......	......	87	86	91	44	94	57	99	63
Cartersville	......	......	......	......	......	......	85	39	91	38	93	55	96	63
Columbus	......	......	......	......	......	......	85	46	91	52	98	60	[a]95	[a]68
Duck	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Eastman	......	......	......	......	......	......	87	40	94	41	99	54	99	64
Forsyth	78	20	72	23	82	32	90	50	92	52	95	66	97	70
Fort Gaines	......	......	......	......	......	......	88	41	93	47	97	56	99	67
Gainesville	......	......	......	......	......	......	82	35	88	37	95	54	101	59
Griffin	......	......	......	......	......	......	85	41	92	46	95	55	95	65
Hephzibah	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Jessup	......	......	......	......	......	......	94	41	98	51	102	55	104	65
Macon	......	......	......	......	......	......	90	43	98	49	100	56	100	67
Marietta	71	12	67	11	......	......	......	......	85	54	90	63	95	65
Milledgeville	71	19	68	22	78	28	84	46	90	47	93	60	95	66
Millen	......	......	......	......	......	......	90	42	97	49	102	57	103	63
Newman	......	......	......	......	......	......	88	39	95	43	98	53	98	67
Quitman (1)	......	......	......	......	......	......	91	44	97	51	101	58	[c]102	60
Quitman (2) (10 miles southwest of).	77	26	76	32	78	55	86	51	......	......	......	......	......	......
Savannah	76	27	72	27	78	32	88	48	91	52	96	60	99	67
Smithville	......	......	......	......	......	......	[c]89	[c]42	97	47	101	57	101	67
Thomasville (1)	......	......	......	......	......	......	......	......	......	......	96	66	97	68
Thomasville (2)	......	......	......	......	......	......	90	46	94	52	100	60	102	69
Toccoa	......	......	......	......	......	......	88	37	89	43	97	52	98	60
Union Point	......	......	......	......	......	......	......	35	91	38	94	54	98	56
Washington	......	......	......	......	......	......	90	40	94	47	97	55	99	62
Way Cross	......	......	......	......	......	......	[f]91	[g]44	97	53	[h]102	[h]66	[b]103	[b]62
Waynesborough	......	......	......	......	......	......	87	41	94	48	96	59	101	65
West Point	......	......	......	......	......	......	84	50	90	55	93	64	95	72
Idaho:														
Boisé Barracks	56	—28	64	22	68	14	88	24	87	35	88	39	103	44
Boisé City	61	—28	64	24	66	18	88	25	90	32	90	40	102	43
Fort Sherman	46	—34	57	15	60	6	78	25	90	32	82	44	97	38
Lewiston	51	—20	65	26	82	14	88	34	99	48	94	56	103	56
Illinois:														
Albion	......	......	61	0	66	15	85	32	90	39	103	52	......	......
Aledo	......	......	53	—20	59	0	82	31	83	29	96	42	100	54
Aurora	40	—23	47	—21	57	0	85	28	84	32	92	38	......	......
Beason	52	—14	52	— 6	62	8	83	31	83	36	96	42	98	56
Belvidere	35	—28	45	—27	54	— 2	83	32	80	40	95	46	93	55
Benton	66	— 4	64	1	76	19	87	38	90	46	93	55	......	......
Brush Hill	......	......	......	......	......	......	84	34	89	41	98	49	103	62
Cairo	73	0	66	10	76	21	82	40	84	42	89	51	95	65
Cedarville	36	—27	48	—26	52	0	86	30	83	34	89	49	97	56
Centralia	......	......	60	1	74	14	89	36	92	30	93	50	101	68
Charleston	59	—12	57	— 7	70	8	84	28	87	35	94	44	95	56
Chicago	44	—17	47	—18	64	— 1	83	30	81	32	90	43	94	56
Collinsville	64	—10	62	— 2	73	13	87	32	88	38	90	45	96	50
Dwight	44	—21	48	—20	60	0	83	28	86	34	93	38	102	51
Eberle	60	—11	......	......	70	10	......	......	84	34	......	......	101	66
Fairfield	66	0	64	6	71	17	87	33	88	32	94	......	98	64
Fairview	40	—25	46	—12	55	0	......	......	......	......	......	......	......	......
Flora	62	— 7	63	0	68	14	89	31	84	30	96	38	98	58

annual range of temperature, etc.—Continued.

August.		September.		October.		November.		December.		Annual range.	Authority.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
°	°	°	°	°	°	°	°	°	°	°	
95	78	92	68	91	52	87	34	80	27	70	A. H. Adams.
97	73	92	64	90	53	86	36	80	29	68	J. S. Wade.
96	67	92	55	86	50	83	38	74	28	70	Signal Service.
90	72	89	67	86	61	83	43	78	36	58	Do.
91	71	89	71	85	66	84	58	79	52	39	Do.
....	....	....	....	....	....	....	....	....	....	....	J. G. Knapp.
94	74	92	65	92	55	90	38	83	34	60	Mrs. Mary W. Broberg.
96	74	91	51	91	54	85	42	72	32	....	Mrs. B. E. Dupont.
93	72	90	64	87	63	84	45	75	34	62	Rev. J. H. White.
....	....	94	68	89	53	84	41	77	32	....	Signal Service.
91	70	89	54	83	51	81	34	68	28	68	Do.
93	71	83	61	84	53	84	40	73	29	65	U. S. post hospital.
92	70	91	49	86	48	82	33	74	25	68	Rev. W. H. Carter.
91	69	90	58	88	53	84	39	75	32	63	Signal Service.
98	55	[c]90	[c]40	....	....	....	....	....	....	....	Do.
97	58	[a]92	[a]47	[a]84	[a]41	....	....	....	....	....	Do.
102	62	100	39	100	39	97	29	82	24	....	H. W. Bryant.
100	54	87	39	78	40	76	30	62	24	85	Prof. L. H. Charbonnier.
102	55	89	35	79	36	....	....	....	....	....	Signal Service.
96	62	87	43	79	40	77	28	63	21	83	Do.
100	58	91	41	84	42	80	29	69	23	82	Do.
94	65	93	50	86	41	....	....	....	....	....	Do.
97	56	85	41	81	41	....	....	....	....	....	Do.
97	55	85	41	81	35	....	....	....	....	....	Do.
96	62	[e]89	[e]58	....	....	....	....	....	....	....	Do.
....	....	84	30	74	29	73	20	59	15	....	A. L. Gillespie.
100	58	[b]91	[b]40	[a]85	[a]40	....	....	....	....	....	Signal Service.
97	68	92	47	88	47	82	36	72	24	77	Thomas G. Scott.
109	63	96	45	87	41	....	....	....	....	....	Signal Service.
92	55	90	33	77	33	....	....	....	....	....	Do.
95	63	86	42	81	40	....	....	....	....	....	Do.
....	....	76	49	72	50	76	39	68	30	....	R. L. Rhodes.
102	62	97	48	86	44	....	....	....	....	....	Signal Service.
97	60	89	53	81	42	....	....	....	....	....	Do.
95	55	84	36	79	35	77	28	64	20	....	Philip A. Cobb.
96	60	86	43	79	43	76	32	63	24	77	S. A. Cook.
100	59	92	41	84	35	....	....	....	....	....	Signal Service.
100	57	90	44	86	40	....	....	....	....	....	Do.
101	65	95	50	92	42	....	....	....	....	....	Do.
....	....	....	....	85	45	80	36	69	26	....	J. L. Cutler.
97	64	92	48	82	49	81	37	69	25	74	Signal Service.
103	60	95	43	[c]85	[c]36	....	....	....	....	....	Do.
97	63	93	48	....	....	....	....	....	....	....	C. S. Boudurant.
101	63	97	46	[d]88	[d]41	....	....	....	....	....	Signal Service.
98	55	85	38	78	32	....	....	....	....	....	Do.
102	53	[a]89	[a]35	81	36	....	....	....	....	....	Do.
100	59	88	41	80	41	....	....	....	....	....	Do.
....	....	....	....	84	44	....	....	....	....	....	Do.
99	60	90	50	....	....	....	....	....	....	....	Do.
95	68	87	53	80	48	....	....	....	....	....	Do.
102	47	100	41	80	26	61	19	62	9	131	U. S. post hospital.
103	47	100	40	82	25	65	18	62	10	131	Signal Service.
98	42	79	45	78	22	52	15	52	9	132	U. S. post hospital.
105	61	99	48	91	32	61	21	53	14	125	Robert Schleicher.
....	....	88	39	....	....	76	25	....	..	....	State weather service.
100	46	86	32	74	27	77	16	58	12	....	Do.
94	42	88	32	78	24	76	18	54	12	....	M. M. Robbins.
98	42	88	32	76	26	78	19	57	14	112	State weather service.
96	52	83	32	73	28	73	13	53	14	124	Do.
103	54	86	35	80	26	82	20	50	12	....	Do.
95	56	92	39	81	29	80	18	56	18	....	Do.
97	58	88	42	82	36	78	28	62	20	97	Signal Service.
93	53	81	32	75	29	69	15	59	10	124	State weather service.
102	58	86	38	82	32	76	22	54	18	....	Do.
98	46	90	36	81	37	79	22	52	18	110	J. B. Dazey.
91	51	88	36	76	32	75	20	53	15	112	Signal Service.
96	50	87	38	84	33	78	26	58	19	106	Dr. J. L. R. Wadsworth.
102	46	91	32	79	21	79	16	55	9	123	State weather service.
....	....	....	....	....	....	72	22	....	....	....	Do.
102	55	94	42	87	31	80	28	59	23	102	Do.
....	....	....	....	....	....	....	....	....	....	....	Do.
100	44	86	32	78	27	78	20	66	18	107	Do.

Table of maximum and minimum temperature and

States and stations.	January.		February.		March.		April.		May.		June.		July.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Illinois—Continued.	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Gibson City	47	—12	58	—12	64	6	82	32	84	36	90	46	......	......
Golconda	63	2	63	11	78	20	87	42	86	44	92	58	95	66
Greenville	60	—11	60	— 4	73	10	87	29	87	34	92	44	98	56
Griggsville	55	—16	56	— 8	67	8	87	28	88	32	90	43	106	61
Harrisburg	69	— 3	65	6	77	18	......	......	......	......	......	......	......	......
Hennepin	46	—20	51	—18	63	2	87	25	89	29	93	39	97	50
Hoopeston	51	—18	55	—13	66	— 3	83	28	83	30	......	......	......	......
Irishtown	58	—10	60	— 2	74	13	86	37	87	45	93	52	97	65
Jacksonville	55	—17	56	— 8	65	8	80	31	84	35	89	45	95	60
Joliet	40	—16	47	—16	60	4	82	30	......	......	98	45	98	54
Jordan's Grove	64	— 6	64	2	76	16	89	33	90	38	92	43	100	62
Kampville	......	......	......	......	......	......	84	33	89	46	92	52	98	65
Lacon	47	—18	54	—18	64	2	86	33	86	40	93	48	99	61
Lake Forest	37	—21	45	—20	55	0	84	24	80	28	91	36	95	51
Lanark	35	—25	40	—25	53	— 5	81	28	78	32	85	43	95	54
McLeansboro	68	— 3	64	0	72	16	86	32	92	35	98	45	102	62
Mahomet	52	—18	53	— 9	......		......	......	83	32	89	36	95	52
Martinsville	......	......	59	— 4	68	10	82	30	......	......	94	49	......	......
Mascoutah (1)	62	—13	60	— 5	84	12	87	30	86	32	90	44	101	60
Mascoutah (2)	61	— 7	62	1	76	15	87	35	86	39	91	45	102	62
Mattoon	55	—10	59	— 7	71	8	81	26	92	36	97	44	101	62
Mount Morris	38	—30	48	—28	60	0	85	30	80	36	94	50	102	58
New Athens	66	—12	62	— 2	......	......	84	34	90	45	95	56	......	......
Old Du Quoin	......	......	......	......	......	......	......	......	......	......	......	......	103	59
Olney	62	— 4	......	......	65	14	......	......	89	42	94	50	97	63
Oneida	44	—24	52	—20	60	2	82	32	84	34	92	48	98	58
Oquawka	44	—28	60	—18	62	0	84	38	84	39	93	52	103	63
Oswego	40	—22	48	—24	56	0	83	27	84	34	92	46	100	52
Ottawa	46	—21	46	—20	60	— 2	83	30	83	36	93	52	98	56
Palestine	58	— 8	56	2	73	12	81	33	87	32	99	45	94	58
Pana	50	—14	50	—10	60	6	76	30	75	35	84	40	96	58
Paris	54	—12	58	— 6	65	8	80	30	84	37	93	44	92	60
Payson	56	—18	61	—10	71	9	......	......	......	......	......	......	......	......
Pekin	50	—19	53	—11	67	5	87	28	83	33	97	41	102	55
Peoria	48	—15	54	—12	68	7	86	32	84	35	94	46	100	58
Philo	51	—12	50	—10	66	6	82	26	84	36	91	40	94	63
Pontiac	42	—18	......	......	......	......	......	......	......	......	90	38	102	54
Prairieville	37	—24	43	—26	54	0	84	32	82	36	......	......	......	......
Richview	61	— 7	62	0	71	12	83	32	84	84	89	42	99	56
Riley	34	—26	42	—27	56	— 2	81	27	78	31	88	39	93	49
Rockford	38	—26	44	—28	51	— 3	81	27	81	29	89	40	93	50
Sandwich	45	—24	46	—22	58	1	86	33	86	36	93	51	100	60
South Evanston	39	—20	45	—20	64	1	84	26	83	29	94	36	94	51
Springfield	53	—17	54	— 9	66	6	80	30	85	35	89	43	97	59
Sterling	44	—25	55	—28	58	— 3	80	24	80	26	......	......	......	......
Sumner	64	— 6	60	0	72	14	84	32	90	34	102	50	98	66
Sycamore	39	—22	41	—24	52	0	80	30	81	33	89	44	96	49
Three Mile	62	— 6	66	0	74	14	84	32	......	......	......	......	......	......
Vandalia	57	— 6	57	0	68	14	81	32	90	35	93	46	......	......
Wapella	......	......	57	— 8	70	8	86	36	......	......	......	......	......	......
Warren	......	......	......	......	52	—10	82	24	82	30	......	......	......	......
Watseka	48	—22	50	—14	64	2	85	28	85	33	98	38	89	54
Wheeling	40	—21	46	—22	......	......	84	27	82	32	......	......	......	......
White Hall	58	—16	58	— 4	68	10	84	32	86	38	88	52	94	66
Willow Hill	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Winchester	60	—18	51	0	62	13	81	30	86	36	92	38	102	53
Windsor	58	—13	56	— 7	68	8	80	20	85	36	92	40	95	57
Winnebago	......	......	......	......	......	......	88	30	88	28	97	32	100	59
Woodstock	38	—27	43	—26	57	0	......	......	......	......	......	......	......	......
Indiana:														
Angola	42	—10	48	—10	60	2	84	24	83	29	102	45	93	56
Blue Lick	......	......	......	......	69	13	84	33	87	38	95	51	93	60
Brookville	59	5	......	......	71	13	......	......	86	44	97	46	94	56
Butlerville	66	0	62	5	72	9	87	33	91	35	101	52	100	66
Columbia City	45	—13	49	— 7	77	3	81	28	80	35	......	......	92	56
Columbus	58	1	54	5	64	12	82	32	86	39	98	51	98	60
Connersville	56	1	64	1	68	10	89	32	82	40	95	48	92	60
Crawfordsville	57	—10	52	— 5	......	......	83	33	85	29	92	49	97	......
Degonia	67	4	58	8	68	18	78	34	84	37	92	47	92	60
Delphi	54	—15	49	1	66	3	84	30	84	39	99	49	98	63
Farmland	58	0	52	0	62	8	82	32	82	40	96	49	91	60
Fortville	58	— 5	58	— 3	65	6	84	26	91	29	98	37	94	50
Fort Wayne	48	— 6	......	......	54	0	82	32	......	......	......	......	......	......
Franklin	59	— 2	54	1	66	11	83	35	86	40	95	52	96	62
Huntingburgh	64	0	58	9	69	14	......	......	89	40	90	53	......	......
Indianapolis	60	— 6	60	— 2	69	9	83	31	86	36	96	45	95	58

annual range of temperature, etc.—Continued.

August.		September.		October.		November.		December.		Annual range.	Authority.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
°	°	°	°	°	°	°	°	°	°	°	
....	....	....	....	74	28	73	20	58	13	....	State weather service.
98	62	92	45	82	36	82	28	64	20	96	Do.
....	....	92	32	85	30	78	23	54	19	....	Do.
99	48	86	37	75	32	75	15	58	16	122	Do.
....	....	....	....	....	....	....	....	....	....	....	Do.
102	39	91	30	79	24	81	16	56	11	122	Do.
....	....	....	....	....	....	....	....	....	....	....	Do.
100	58	91	39	85	35	80	24	60	20	110	Do.
94	51	87	37	75	34	76	22	55	17	112	Philip J. Hasenstab.
99	40	82	36	76	30	....	....	....	....	....	State weather service.
101	52	91	40	87	32	79	24	58	20	107	Do.
99	53	....	....	81	28	81	20	60	17	....	Do.
94	52	88	32	76	26	80	24	55	18	117	Do.
93	47	86	30	72	27	74	4	50	7	116	Do.
90	51	83	34	76	31	72	17	....	....	....	Do.
109	51	89	34	82	60	79	26	60	16	112	Do.
....	....	....	....	....	....	76	21	52	16	....	Do.
96	56	78	34	68	28	60	22	....	....	....	Do.
100	52	92	38	80	30	78	24	....	....	....	Do.
101	50	89	44	85	34	....	....	....	....	....	Do.
101	43	94	32	74	29	77	22	51	15	111	William Dozier.
98	48	85	32	75	23	75	16	52	14	132	William Feary.
....	....	....	....	81	38	76	29	56	22	....	State weather service.
....	....	93	40	86	32	78	26	59	20	....	Do.
96	57	88	41	80	32	78	25	56	19	....	Do.
96	51	....	....	76	30	78	18	56	14	....	Do.
102	56	92	38	82	38	78	26	54	18	131	Do.
96	48	84	29	72	28	74	15	46	11	124	John S. Seeley.
95	50	80	34	76	29	76	16	55	12	119	State weather service.
97	47	86	32	81	28	76	24	56	20	107	John E. Templeton.
99	53	86	40	82	32	78	26	58	22	113	State weather service.
94	48	88	36	78	32	74	24	54	18	106	Do.
....	....	....	....	....	....	....	....	....	....	....	Do.
102	45	90	32	78	26	....	....	60	14	121	Rev. J. E. Terborg.
101	52	91	35	79	30	80	25	57	18	116	Dr. Fred. Brendel.
94	46	88	34	78	27	74	18	52	14	106	State weather service.
102	42	92	32	74	26	76	18	54	12	....	Do.
....	....	....	....	....	....	....	....	....	....	....	Do.
98	49	....	....	....	31	76	25	55	19	....	Do.
91	46	80	31	73	27	67	13	49	11	120	John W. James.
90	46	81	28	75	26	73	15	52	12	121	T. C. Robertson.
99	55	85	40	76	34	77	19	54	15	124	Dr. N. E. Ballou.
95	43	86	32	74	28	76	11	52	12	115	Dr. M. D. Ewell.
95	48	89	36	77	32	77	23	55	16	114	Signal Service.
....	....	....	....	....	....	....	....	....	....	....	State weather service.
98	48	90	32	80	28	76	26	60	18	108	Do.
96	43	81	27	72	25	71	15	50	13	120	Roswell Dow.
....	....	....	....	....	....	....	....	....	....	....	State weather service.
100	51	85	36	77	29	73	26	53	20	....	Do.
....	....	....	....	....	....	75	22	50	16	....	Do.
....	....	....	....	....	....	....	....	....	....	....	Do.
99	37	90	31	75	25	76	19	52	11	121	Do.
....	....	....	....	....	....	....	....	....	....	....	Do.
94	52	86	40	78	34	76	26	....	....	....	Do.
96	51	86	37	79	32	78	27	56	20	....	Do.
102	42	94	28	84	25	82	17	59	15	120	Do.
94	46	88	34	80	28	77	22	55	17	108	A. H. Hatch.
96	52	86	32	78	30	72	14	54	12	....	State weather service.
....	....	80	26	....	....	....	....	48	6	....	Do.
94	44	83	39	70	26	72	21	51	11	112	Do.
96	54	82	40	74	35	75	28	57	18	....	Do.
....	....	....	....	....	....	....	....	....	....	....	Do.
100	56	86	34	78	32	74	25	60	12	99	C. F. Hole.
94	44	86	35	74	29	75	19	52	10	....	State weather service.
98	54	86	35	76	30	72	24	53	16	97	Do.
90	54	82	34	77	32	72	23	58	13	94	Robert Hessler.
95	49	....	....	....	....	72	26	62	17	....	State weather service.
95	53	83	37	74	31	75	27	57	20	91	Do.
98	53	88	37	77	30	75	20	54	11	114	Do.
94	46	86	36	72	30	74	22	56	10	96	Do.
....	....	....	....	....	....	....	....	....	....	....	Do.
....	....	....	....	....	....	....	....	....	....	....	Do.
....	....	86	35	77	33	73	25	....	....	....	Do.
99	59	....	....	77	31	72	26	58	20	....	Do.
98	49	88	34	78	32	76	26	56	17	104	Signal Service.

Table of maximum and minimum temperature and

States and stations.	January.		February.		March.		April.		May.		June.		July.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Indiana—Continued.	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Jeffersonville	68	4	64	11	71	16	84	23	90	37	97	46	96	60
Laconia	66	5	60	7	75	14	88	29	92	32	99	65	104	66
La Fayette	47	—16	58	—10	66	3	83	27	85	82	97	40	96	50
La Grange	41	—14	46	—12	69	2	83	22	82	32	96	40	92	48
Logansport	54	—19	58	— 8	72	2	89	30	90	39	96	46	97	56
Marengo	66	10	68	11	79	17	85	37	89	35	96	52	98	64
Marion	......	......	......	......	......	......	83	28	85	35	99	48	93	56
Mauzy	58	— 3	55	— 2	66	5	83	25	86	31	99	89	98	50
Mount Vernon	64	— 1	62	6	71	18	83	33	88	38	94	52	96	60
Muncie	60	— 8	52	0	65	0	84	28	80	34	100	51	105	55
Princeton	57	— 2	64	2	68	15	83	32	91	34	105	45	102	63
Richmond	56	0	56	— 2	67	7	80	32	81	28	98	44	93	58
Rockville	58	—10	52	— 5	64	7	84	30	84	32	99	44	94	60
Salem	64	3	59	9	68	13	[f]85	36	86	42	95	54	90	65
Scalesville	......	......	......	......	......	......	......	......	......	......	......	......	99	62
Seymour	63	6	57	9	68	14	81	33	84	42	90	53	90	63
Spiceland	59	— 4	58	— 2	67	5	83	29	......	......	......	......	......	......
Sunman	59	1	55	3	69	8	83	25	85	32	94	42	91	53
Terre Haute	60	—10	59	— 4	67	8	82	32	89	35	96	45	95	58
Vevay	65	8	65	8	74	14	86	28	90	32	99	43	97	57
Worthington	60	— 2	59	1	66	10	82	32	86	34	93	52	90	63
Indian Territory:														
Caddo Creek	......	......	......	......	......	......	......	......	......	......	......	......	[b]96	[a]64
Fort Gibson	74	—10	66	10	81	12	91	29	87	37	99	50	102	56
Fort Reno (1)	69	—12	73	10	90	15	95	34	88	44	96	51	99	61
Fort Reno (2)	69	—13	74	10	88	13	85	33	85	43	96	50	99	63
Fort Sill	71	— 7	75	19	86	20	92	36	90	45	96	55	99	60
Fort Supply (1)	69	—10	76	13	83	10	88	37	98	40	96	54	100	64
Fort Supply, (2)	75	—15	78	8	85	......	90	32	85	40	99	55	101	64
Iowa:														
Amana	......	......	......	......	63	— 2	86	25	83	29	94	38	96	54
Ames	39	—32	46	—25	65	— 4	72	30	78	30	86	38	92	58
Auburn	40	—19	50	—23	67	— 7	78	32	70	42	90	......	......	......
Bancroft	40	—36	43	—30	59	—10	79	20	80	30	94	50	......	......
Cedar Rapids	37	—32	49	—26	65	— 4	82	20	80	25	94	34	98	52
Clarinda	......	......	54	— 4	70	4	81	28	84	39	90	49	96	65
Clear Lake	38	—36	41	—32	49	— 8	70	32	81	30	97	38	97	55
Clinton	36	—31	40	—29	58	— 2	90	27	88	28	96	40	101	53
Cresco	35	—43	46	—34	43	—10	74	25	77	80	89	46	90	56
Cromwell	......	—29[g]	45	—19	......	6	......	30	......	[h]38	......	53	......	66
Davenport	42	—24	60	—21	61	0	81	29	80	32	88	46	95	55
Des Moines (1)	44	—27	57	—21	73	— 5	80	21	81	34	88	43	99	57
Des Moines (2) (5½ miles southeast of).	44	—32	52	—25	72	— 9	78	24	82	33	88	41	99	56
Dubuque	37	—30	51	—23	58	— 5	82	28	78	30	89	42	94	54
Dysart	32	—20	46	—32	51	— 8	80	25	76	33	90	34	96	67
Elkader	......	......	......	......	......	......	79	29	80	32	98	40	94	59
Fayette	......	......	......	......	......	......	......	......	......	......	93	40	93	48
Fort Madison	46	—22	59	—15	62	5	82	33	83	41	93	54	97	64
Glenwood (1)	58	—33	64	—20	78	— 8	86	33	86	38	102	38	100	58
Glenwood (2)	48	—40	59	—20	70	—10	82	20	84	28	100	47	102	62
Grinnell	......	......	......	......	......	......	......	......	77	33	86	46	93	60
Hampton	......	......	......	......	......	......	75	22	81	22	92	36	94	53
Humboldt	36	—35	42	—34	63	—11	74	18	79	26	88	43	94	51
Independence	85	—29	43	—29	52	— 2	75	32	78	85	84	51	87	57
Iowa City	......	......	......	......	57	9	72	29	73	33	80	44	92	51
Keokuk	53	—23	61	—12	70	5	81	29	83	36	88	46	96	61
Logan	45	—35	56	—20	74	—12	86	20	89	33	98	37	98	50
Manson	44	—34	50	—34	64	— 6	76	22	76	34	96	36	100	62
Maquoketa*	40	—35	52	—30	61	15	87	41	82	41	90	58	99	72
Monticello	39	—31	49	—28	55	— 4	82	24	82	28	92	37	100	53
Mount Pleasant	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Mount Vernon	39	—33	50	—30	55	— 5	84	27	87	32	96	51	100	65
Muscatine	39	—30	51	—20	67	0	......	......	82	29	88	50	103	50
Osceola	40	—34	48	—26	68	— 5	70	20	67	33	78	37	87	57
Oskaloosa (1)	47	—31	49	—23	70	5	82	19	80	42	96	41	97	62
Oskaloosa (2)	34	—29	51	—23	70	— 3	86	25	71	47	96	41	99	58
Sac City	38	—29	47	—26	68	—10	78	26	76	34	92	48	97	64
Vinton	......	......	......	......	60	— 3	71	28	78	36	87	51	95	57
Webster City	40	—32	48	—27	66	— 8	74	28	78	36	......	......	......	......
Wesley	......	......	55	—35	60	— 5	......	......	79	29	91	51	95	56
West Bend	37	—36	43	—32	68	— 8	82	24	......	......	......	......	......	......
Kansas:														
Allison	......	......	......	......	......	......	......	......	87	38	99	57	102	56
Brookville	......	......	......	......	......	......	......	......	......	......	106	50	113	63
Buffalo Park	......	......	......	......	......	......	......	......	......	......	100	50	105	68

* After February the extremes of temperature were taken from readings of the "exposed" thermometer at 2 p. m. daily.

annual range of temperature, etc.—Continued.

August.		September.		October.		November.		December.		Annual range.	Authority.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
°	°	°	°	°	°	°	°	°	°	°	
96	51	84	39	77	31	75	27	61	20	93	J. C. Loomis.
106	60	86	38	76	32	75	24	62	14	101	Lafe Crozier.
97	40	91	33	80	26	73	21	54	11	113	Purdue Institute.
95	42	....	....	....	....	73	18	52	13	....	State weather service.
95	43	....	....	....	....	80	25	....	....	....	Thos. B. Helm.
99	50	88	38	79	32	79	28	60	22	89	State weather service.
100	53	86	37	....	....	75	22	54	10	....	Do.
97	41	83	29	74	24	70	19	55	7	102	Do.
98	51	86	40	79	31	72	26	58	20	99	Do.
....	....	....	....	....	....	....	....	....	....	....	Do.
106	53	90	36	78	32	75	27	58	16	108	Do.
93	44	82	36	75	28	70	23	54	11	100	Do.
97	50	85	31	78	28	72	24	55	16	109	Do.
93	56	[j]80	[k]41	76	32	73	25	55	17	92	J. W. May.
102	58	89	41	....	....	81	27	62	20		Urias Wilson.
90	51	82	44	74	34	76	26	60	20	84	State weather service.
....	....	....	....	77	27	73	23	54	14	....	Do.
95	47	86	30	76	28	72	22	59	12	94	Do.
96	49	87	33	80	29	75	24	57	19	106	Signal Service.
97	50	85	36	77	32	78	24	60	15	91	State weather service.
94	54	83	34	75	28	74	22	56	17	96	Do.
99	67	93	48	89	38	82	20	78	17	....	R. Leming, M. D.
102	56	95	40	87	29	83	25	69	19	112	United States post hospital.
103	60	97	43	86	34.	85	21	68	21	115	Signal Service.
104	58	94	40	86	32	85	20	68	19	117	United States post hospital.
105	60	91	44	88	33	84	22	69	20	112	Signal Service.
104	60	88	51	88	35	79	19	70	20	114	Do.
109	61	94	37	92	29	81	20	72	16	124	United States post hospital.
95	45	84	27	72	22	71	15	57	5	....	Conrad Schadt.
90	54	83	38	74	25	73	12	59	4	124	J. Rush Lincoln.
....	....	....	....	....	....	....	....	....	....	....	Edwin Miller.
96	47	88	30	....	....	....	....	60	1	....	H. N. Renfrew.
95	46	84	29	72	25	69	12	57	6	130	H. D. Olds.
95	55	91	41	78	28	74	11	60	10	....	A. S. Van Sandt.
97	46	86	31	75	28	69	7	56	5	133	Dr. J. C. Wright.
100	46	86	29	74	25	76	16	59	6	132	Luke Roberts.
93	50	81	31	76	26	69	0	53	1	136	Gregory Marshall.
110	53	....	40	....	31	....	16	52	11	....	E. E. and H. C. Harrison.
95	50	85	34	74	30	78	19	58	12	119	Signal Service.
97	46	90	32	79	28	75	15	60	11	126	Do.
99	46	90	32	79	25	74	13	61	10	131	Adolphus Voegeli.
96	48	83	31	77	28	72	16	58	8	126	Signal Service.
98	44	87	29	71	22	68	9	52	2	130	Jos. Dysart.
94	54	80	34	76	30	70	10	54	— 6	....	J. N. Hamilton.
97	40	85	18	75	22	68	5	54	— 2	....	R. Z. Latimer.
96	57	87	34	75	30	75	19	58	14	119	Miss L. A. McCready.
100	46	96	36	76	22	76	8	76	2	135	Seth Dean.
101	50	92	30	84	26	82	12	60	— 4	142	A. Schappel.
91	51	84	38	71	31	70	14	56	7	....	Prof. S. J. Buck.
95	43	88	28	74	25	72	6	55	4	....	E. C. Grenelle.
95	43	82	32	73	22	78	6	56	1	130	Miss Florence Prouty.
88	56	76	34	68	32	66	14	52	7	117	Iowa Hospital for the Insane.
93	54	82	39	68	31	73	23	53	13	....	Prof. A. A. Veblen.
95	51	87	35	78	32	79	22	61	14	119	Signal Service.
96	45	92	34	82	25	76	10	66	2	133	Mrs. M. B. Stern.
98	58	84	38	74	30	74	12	60	6	134	W. L. Thompson.
96	68	82	54	74	46	72	35	60	22	134	A. B. Bowers.
94	46	82	26	73	23	70	12	57	3	131	H. D. Smith.
90	56	79	40	73	34	73	20	50	14	....	Prof. Max. E. Witte.
99	56	84	35	....	....	68	14	56	9	133	Prof. Alonzo Collin.
98	42	87	32	76	27	78	18	60	9	133	J. P. Walton.
87	48	75	32	65	25	....	8	51	8	121	F. M. Kyte.
96	50	88	37	76	29	75	16	60	12	128	Jos. Boyd.
96	50	88	34	76	29	74	16	60	11	128	O. H. Avey.
95	51	87	37	72	27	68	10	59	4	126	Caleb Brown.
95	53	[c]84	27	[b]73	23	[a]64	11	52	4	....	T. F. McCune.
....	....	....	....	....	....	....	....	....	....	....	E. N. and Geo. W. Lee.
94	43	83	26	73	22	72	7	56	1	....	Wm. Ward.
....	....	....	....	....	....	....	....	....	....	....	J. H. Warren.
98	51	96	32	84	22	72	13	65	4	....	John J. Cass.
113	59	99	36	96	26	86	17	68	18	....	State weather service.
....	....	....	....	86	86	80	10	72	10	....	Do.

Table of maximum and minimum temperature and

States and stations.	January.		February.		March.		April.		May.		June.		July.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Kansas—Contiued.	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Bunker Hill	...	...	...	...	...	...	...	...	...	...	110	60	117	70
Carneiro	...	...	...	...	...	...	...	...	...	...	96	56	103	70
Cawker City	...	...	66	3	82	2	...	...	84	43	94	56	105	60
Colby	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Coldwater	...	...	...	...	...	...	...	...	...	...	...	...	97	69
Collyer	...	...	...	...	...	...	...	...	...	...	1 0	52	109	64
Concordia (near)	...	...	...	...	...	...	...	...	...	...	...	...	102	58
Concordia	61	—25	71	— 8	81	1	93	28	89	37	96	44	103	58
Dodge City	69	—18	78	4	75	— 2	90	31	84	39	96	50	102	60
Dorrance	...	...	...	...	...	...	...	...	...	...	105	64	113	77
East Norway	51	—20	54	1	75	11	80	33	83	42	...	...	100	66
Elco	...	...	...	...	...	...	...	...	...	...	...	...	...	...
El Dorado	62	—18	68	7	...	...	88	30	...	...	...	...	...	...
Elk Falls	69	—12	65	10	87	12	85	34	86	35	94	45	103	60
Ellis	...	...	...	...	...	...	...	...	...	...	98	38	105	57
Ellsworth	...	...	...	...	...	...	...	...	...	...	100	46	108	50
Emporia	60	—17	62	8	76	13	87	35	80	63	101	61	99	68
Englewood	...	...	...	...	...	...	...	...	...	...	98	60	102	69
Eustis (Goodland)	...	...	69	7	...	...	...	...	...	...	...	...	101	49
Gibson	...	...	74	2	78	— 4	...	...	90	38	...	...	110	60
Globe	56	—26	58	— 2	77	12	87	37	86	44	93	54	96	70
Gorham	...	...	...	...	...	...	...	...	...	...	100	50	110	70
Gove City	...	...	...	...	...	...	...	...	...	...	...	...	102	59
Grainfield	...	...	...	...	...	...	...	...	...	...	102	50	106	64
Grenola	...	...	67	9	...	...	...	...	...	...	103	58	108	70
Grinnell	...	...	...	...	...	...	...	...	...	...	106	54	112	64
Halstead	...	...	...	...	...	...	...	...	...	...	102	43	104	61
Havensville	...	...	...	...	...	...	...	...	...	...	104	46	...	...
Hays, Fort	66	—22	79	— 2	76	2	91	23	85	32	97	45	107	55
Hays City	...	...	...	...	...	...	...	...	...	...	100	58	106	66
Horton	...	...	...	...	...	...	...	...	...	...	97	62	104	62
Independence	70	—13	64	10	87	—15	87	34	86	41	96	50	104	63
Kanopolis	...	...	...	...	...	...	...	...	...	...	100	72	105	70
Lawrence	...	...	57	— 1	78	14	88	31	83	38	94	52	97	62
Leavenworth	55	—21	62	— 5	78	11	87	30	83	36	96	48	97	60
Leavenworth, Fort	...	...	...	...	...	...	...	...	...	...	...	...	95	61
Lebo	...	...	69	— 2	85	10	94	27	89	38	101	39	106	60
Leoti	63	—25	63	8	...	—4	...	28	84	30	103	41	...	...
McAllaster	...	...	...	...	...	...	...	...	...	...	100	47	102	60
Manhattan (1)	63	—26	71	— 4	83	8	93	28	88	30	99	50	107	58
Manhattan (2)	54	—28	68	— 4	80	2	93	32	88	44	99	50	106	65
Montero	...	...	...	...	...	...	...	...	...	...	110	44	116	62
Monument	...	...	...	...	...	...	...	...	...	...	104	50	106	66
Morse	52	—24	56	2	72	12	82	25	84	38	92	50	96	64
Ninnescah (Cunningham).	71	—19	74	2	73	2	92	27	94	39	98	51	105	59
Oakley	...	...	...	...	...	...	...	...	...	...	101	50	106	58
Ogallah	...	...	...	...	...	...	...	...	...	...	...	...	105	70
Pence	...	...	...	...	...	...	...	...	...	...	105	52	...	...
Quinter	...	...	...	...	...	...	...	...	...	...	98	58	108	65
Riley, Fort	56	—26	69	— 5	79	6	90	30	88	38	98	43	103	61
Rome	...	...	70	10	74	16	...	...	90	41	98	50	106	62
Russell	...	...	...	...	...	...	...	...	...	...	100	54	110	66
Salina	51	—12	55	14	62	14	71	38	79	51	98	50	103	70
Sedan	...	...	68	10	86	16	...	...	...	...	99	58	104	71
Seneca	...	...	...	...	...	...	...	...	...	...	...	...	101	64
Topeka (1)	58	—20	65	— 4	82	8	90	27	87	30	96	36	100	58
Topeka (2)	...	...	54	3	82	8	...	...	...	...	96	36	100	58
Toronto	...	...	...	...	...	...	...	...	...	...	92	42	...	...
Tribune	...	...	70	8	74	—6	92	30	89	30	105	47	109	32
Victoria	...	...	...	...	...	...	...	...	...	...	102	...	104	75
Wa Keeney	...	...	...	...	...	...	...	...	...	...	100	48	102	65
Wakefield	60	—24	70	— 1	72	2	90	36	90	45	100	55	106	70
Walker	...	...	...	...	...	...	...	...	...	...	104	60	108	68
Waterville	...	...	59	— 7	...	...	...	...	...	...	...	...	...	...
Wellington	61	—10	65	10	80	14	85	32	88	40	97	48	103	63
Wichita	...	...	...	...	...	...	...	...	...	...	...	...	100	...
Wilson	67	—23	77	0	81	2	88	24	90	33	98	60	104	61
Winona	...	...	...	...	...	...	...	...	...	...	100	52	102	63
Yates Centre	65	—16	66	8	85	12	87	32	85	35	92	42	102	58
Kentucky:														
Ashland	...	...	...	...	...	...	...	...	...	...	...	...	93	52
Bowling Green	72	8	72	10	84	19	92	34	98	37	106	46	106	50
Carlisle	52	6	62	4	73	10	85	26	90	38	99	42	98	54
Frankfort	69	6	69	7	75	15	88	27	92	29	101	44	99	54

annual range of temperature, etc.—Continued.

August.		September.		October.		November.		December.		Annual range.	Authority.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
°	°	°	°	°	°	°	°	°	°		
....	....	....	....	88	28	85	20	69	14	....	Do.
....	....	....	....	88	....	82	20	62	16	....	Do.
100	54	95	40	79	20	76	14	62	6	....	Do.
....	....	....	....	78	21	72	14	62	5	....	Do.
100	55	....	....	....	....	....	....	69	12	....	Do.
....	....	98	46	84	30	78	10	70	12	....	Do.
102	53	....	....	....	....	73	16	70	4	....	Do.
102	53	94	35	82	22	75	16	68	12	128	Signal Service.
104	52	94	41	85	30	84	18	70	11	122	Do.
....	....	98	44	84	30	80	20	68	15	....	State weather service.
....	....	....	....	....	....	....	....	....	....	....	S. E. Hardy.
101	56	....	....	86	29	81	22	64	16	....	State weather service.
....	....	....	....	....	....	....	....	....	....	....	H. C. Ford.
102	55	95	40	88	32	84	25	69	16	115	Dr. A. C. Williams.
....	....	....	....	84	22	82	12	68	18	....	State weather service.
104	42	94	47	....	....	80	20	65	14	....	Do.
98	57	86	42	....	....	79	21	67	16	118	Prof. T. H. Dinsmore, jr.
106	62	96	45	86	33	78	22	70	12	....	C. D. Perry.
98	48	....	....	....	....	....	....	....	....	....	State weather service.
105	52	97	34	84	28	80	8	68	10	....	Do.
97	60	90	45	83	30	77	22	59	12	123	William Featherston.
....	....	97	46	83	33	80	14	74	16	....	State weather service.
....	....	....	....	80	24	75	9	63	4	....	Do.
....	....	96	50	82	30	78	14	62	18	....	Do.
....	....	96	41	88	28	81	20	63	12	....	Do.
....	....	98	46	80	34	78	14	68	10	....	Do.
102	57	91	38	....	....	....	....	57	13	....	Do.
104	56	[c]98	[d]43	84	14	75	12	70	— 2	....	L. W. Dennen.
106	52	96	33	85	20	82	8	69	6	129	U. S. post hospital.
104	60	91	46	....	....	80	16	70	16	....	State weather service.
103	56	....	....	....	....	....	....	....	....	....	Do.
104	56	97	43	87	29	86	23	62	17	119	J. M. Altaffer.
....	....	....	....	89	30	78	18	66	2	....	State weather service.
99	52	91	39	85	32	79	21	60	7	....	Prof. T. H. Snow.
97	53	92	39	86	32	79	22	63	10	118	Signal Service.
96	54	92	38	85	30	78	20	60	5	....	U. S. post hospital.
106	50	100	33	91	26	80	6	69	4	....	C. W. Burnett.
102	50	....	33	....	24	....	14	....	....	....	Levi C. Vickerey.
106	50	....	....	78	32	72	14	66	10	....	State weather service.
104	49	....	....	....	....	....	....	....	....	....	Agricultural College.
103	50	97	38	84	25	80	15	62	2	134	C. P. Blachley.
....	....	95	40	81	36	73	12	71	15	....	State weather service.
....	....	....	....	80	28	74	14	70	8	....	Do.
94	56	90	36	78	28	80	22	64	6	120	R. P. Edgington.
106	57	96	38	87	27	79	18	71	14	125	E. Shaw.
104	50	....	....	88	....	72	18	68	18	....	State weather service.
....	....	....	....	....	....	78	20	68	13	....	Do.
100	54	94	37	....	....	....	....	....	....	....	Do.
....	....	....	....	86	34	78	15	66	10	....	Do.
103	54	94	37	81	27	77	16	61	10	129	U. S. post hospital.
107	60	95	44	86	32	80	23	62	18	....	State weather service.
....	....	....	....	78	32	80	16	63	14	....	Do.
96	70	96	47	74	41	72	28	69	19	115	Jno. H. Gibson.
104	63	95	46	87	30	78	26	66	19	....	J. W. Goodell.
101	50	96	36	86	28	76	12	63	— 2	....	State weather service.
100	50	93	33	86	25	81	12	63	— 3	120	Signal Service.
....	....	93	33	....	....	81	12	63	— 3	....	State weather service.
....	....	91	36	....	....	....	....	66	7	....	Do.
100	49	95	35	84	26	79	12	69	5	....	S. B. Jackson.
....	....	....	....	....	....	80	20	60	17	....	State weather service.
....	....	....	....	....	....	79	12	66	13	....	Do.
105	59	98	39	82	29	80	21	65	15	130	Wm. P. Cochran.
....	....	....	....	....	....	78	9	68	10	....	State weather service.
....	....	....	....	85	30	75	16	....	....	....	Do.
105	56	....	....	....	....	75	22	63	18	....	Do.
102	....	92	....	86	....	78	....	67	....	....	Signal Service.
90	67	....	....	83	30	80	20	64	12	....	Miss Lizzie Dolphin and E. Y. Dollenmayer.
....	....	....	....	86	33	70	14	70	18	....	State weather service.
101	54	91	36	85	27	79	17	66	7	118	F. R. Gray.
96	52	84	38	....	....	77	19	64	8	....	State weather service.
102	53	90	39	77	32	78	22	70	15	98	M. H. Crump.
99	36	87	42	76	28	72	18	....	....	....	W. H. Fritts.
102	48	87	34	79	29	79	23	64	13	96	E. C. Went.

Table of maximum and minimum temperature and

States and stations.	January.		February.		March.		April.		May.		June.		July.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Kentucky—Continued.	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Lexington	68	5	68	4	74	13	84	32	88	34	98	46	95	56
Louisville	69	8	67	8	74	14	85	32	91	38	98	52	96	61
Madisonville	......	......	......	......	......	......	......	......	......	......	......	......	92	54
Millersburgh	......	......	......	......	......	......	......	......	......	......	92	45	92	62
Louisiana:														
Abbeyville	......	......	78	38	82	32	88	55	90	62	92	69	92	66
Alexandria	......	......	74	32	84	31	86	48	89	46	96	63	99	64
Amite City	......	......	......	......	......	......	88	43	94	47	97	57	100	65
Baton Rouge	......	......	71	44	74	37	80	55	85	58	88	68	......	......
Breaux Bridge	......	......	72	40	78	41	89	52	84	58	91	65	......	......
Cheneyville	......	......	......	......	......	......	87	43	91	40	95	61	98	61
Clinton	......	16	......	......	70	24	......	......	......	......	......	......	......	......
Coushatta Chute	72	15	......	......	......	......	......	......	......	......	99	63	99	61
Convent	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Crowley	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Delta	76	18	72	28	83	31	85	46	......	......	......	......	......	......
Donaldsonville	79	21	75	32	79	33	......	......	......	......	......	......	......	......
Farmerville	81	20	75	30	80	30	......	......	90	50	98	59	96	64
Franklinton	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Grand Coteau	75	25	72	36	79	37	85	51	86	56	89	66	94	67
Hahnville	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Houma	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Keatchie	......	......	......	......	......	......	89	47	......	......	96	60	99	62
La Fayette	......	......	......	......	......	......	85	51	92	51	98	55	97	......
Lake Charles	78	25	75	42	70	36	......	......	......	......	......	......	......	......
Lake Providence	......	......	......	......	83	33	89	60	94	61	......	......	102	75
Liberty Hill	74	23	71	31	86	26	90	42	95	46	98	56	102	60
Luling	78	30	76	35	78	35	85	52	87	52	92	65	98	73
Mandeville	76	24	73	30	78	33	88	52	92	53	94	61	99	69
Marksville	......	......	......	......	......	......	......	......	88	60	94	60	96	70
Maurepas	......	......	......	......	78	23	87	......	91	51	92	61	96	69
Melville	......	......	......	......	......	......	89	49	91	46	95	60	98	64
Minden	......	......	......	......	......	......	87	44	93	45	98	58	102	61
Monroe	74	17	68	35	72	36	84	44	91	49	95	59	99	66
Morgan City	77	29	78	32	77	38	84	55	86	56	92	65	95	70
Mount Airy	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Natchitoches	......	......	......	......	82	28	87	47	93	47	98	61	97	63
New Iberia	82	......	......	......	80	36	85	52	87	53	90	65	......	......
New Orleans	80	29	79	35	78	41	85	56	88	60	92	66	96	72
Plaquemine	......	......	......	......	84	56	......	......	......	......	......	......	......	......
Point Pleasant	74	21	71	32	79	33	83	51	......	......	91	71	95	69
Port Eads	76	35	......	......	78	44	85	56	93	59	96	70	......	......
St. Joseph	72	19	......	......	......	......	......	......	87	51	91	63	98	63
St. Martinville	......	......	......	......	75	49	......	......	85	65	......	......	92	......
Shell Beach	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Shreveport	76	15	75	32	81	32	87	46	90	52	97	62	98	67
Sugar experiment station.	......	......	......	......	......	......	......	......	92	54	92	65	98	71
Trinity	......	......	......	......	76	37	83	54	87	57	......	......	96	69
Vidalia	78	20	78	31	88	30	90	46	92	48	96	60	101	66
Maine:														
Bar Harbor	56	—10	46	—8	47	—1	64	13	70	30	94	42	84	48
Belfast	39	—8	43	—6	44	8	62	22	68	34	90	52	81	53
Calais	......	......	......	......	......	......	......	......	......	......	......	......	86	50
Cornish	33	—16	48	—11	46	5	73	15	78	32	93	51	93	51
Eastport	47	—12	45	—8	48	4	56	13	66	30	88	40	77	45
Fairfield	40	—25	47	—21	48	—2	76	12	73	27	......	......	86	45
Gardiner	47	—13	46	—12	49	0	79	15	75	29	97	44	86	50
Kent's Hill	36	—14	41	—14	44	6	62	9	74	31	92	42	84	44
Lewiston	36	—14	43	—18	45	0	76	14	74	30	93	44	86	51
Mayfield	......	......	......	......	......	......	......	......	......	......	94	43	85	46
Orono	47	—20	44	—19	48	2	76	13	75	25	93	44	86	47
Petit Manan	......	......	......	......	......	......	......	......	......	......	71	42	72	44
Portland	47	—12	44	—7	47	7	64	16	67	32	96	45	87	50
Maryland:														
Baltimore	50	9	60	11	74	12	90	33	86	41	94	52	94	57
Barren Creek Springs	......	......	......	......	......	......	......	......	76	35	101	60	91	62
Cumberland	48	4	52	9	68	10	86	26	86	38	94	44	86	54
Fallston	45	2	......	......	......	......	......	......	......	......	......	......	90	54
Gaithersburg	......	......	......	......	......	......	......	......	......	40	......	50	......	55
Galena	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Gambrills	......	......	......	......	......	......	......	......	......	......	......	......	......	......

annual range of temperature, etc.—Continued.

August.		September.		October.		November.		December.		Annual range.	Authority.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
°	°	°	°	°	°	°	°	°	°	°	
99	52	85	85	74	32	74	25	61	15	95	Signal Service.
98	54	86	36	77	32	78	25	62	18	90	Do.
94	64	82	40	78	34	74	26	62	19	....	State weather service.
91	60	81	38	74	35	72	31	63	19	....	Cadesman Pope.
93	73	90	55	85	52	85	38	74	30	....	State weather service.
99	65	94	51	87	45	....	....	....	....	....	Signal Service.
97	67	94	47	88	42	....	....	71	24	....	Do.
91	65	....	....	....	....	82	86	....	....	....	State weather service.
....	....	....	....	....	....	....	....	....	....	....	Do.
94	61	94	58	83	48.	81	30	....	....	....	Signal Service.
96	61	92	54	85	45	81	29	68	19	....	State weather service.
99	67	80	44	86	38	....	....	....	....	....	Signal Service.
....	....	....	....	84	50	87	33	72	24	....	State weather service.
....	....	....	....	88	46	82	33	74	25	....	Do.
....	....	....	....	....	....	....	....	....	....	....	Do.
94	69	....	....	84	47	83	34	69	25	....	Do.
97	70	....	....	87	41	83	31	80	22	....	Do.
90	73	89	56	82	49	79	35	73	28	....	Do.
94	69	90	55	85	51	84	39	71	30	69	Rev. C. M. Widman, S. J.
....	....	....	....	89	46	88	35	74	24	....	State weather service.
....	....	....	....	84	48	84	36	72	28	....	Do.
99	69	....	....	....	....	....	....	....	....	....	Do.
97	72	91	53	86	48	....	....	....	....	....	Signal Service.
....	....	....	....	....		88	29	75	32	....	State weather service.
102	72	97	60	90	....	85	41	74	27	....	Do.
102	67	98	48	92	38	87	29	77	19	83	Dr. E. A. Crawford.
96	67	90	55	84	56	83	47	73	24	72	F. M. Rogers.
97	70	90	52	84	47	84	34	72	25	75	State weather service.
94	69	92	50	86	46	83	34	70	30	....	Do.
93	72	90	55	86	48	84	35	75	32	....	Do.
....	....	....	....	....	....	84	81	....	....	....	Do.
100	69	90	50	88	40	....	....	71	20	....	Do.
98	66	87	48	87	42	81	32	70	24	82	Signal Service.
93	71	94	60	....	....	....	....	....	....	....	State weather service.
....	....	93	56	92	50	90	86	72	30	....	Do.
98	71	90	50	87	43	....	....	....	....	....	Signal Service.
95	71	95	53	91	51	92	86	78	29	....	State weather service.
94	70	91	56	87	55	85	41	72	31	67	Signal Service.
....	....	....	....	....	....	85	28	67	24	....	State weather service.
95	72	87	56	84	46	79	34	67	26	....	Do.
93	72	89	64	81	58	81	49	71	37	....	Mrs. C. L. Kleinpeter.
....	....	....	....	86	39	....	....	....	....	....	State weather service.
92	....	89	67	84	53	81	50	69	43	....	Do.
....	....	89	60	85	57	83	45	68	40	....	Do.
97	69	92	52	87	44	84	34	74	26	83	Signal Service.
95	70	....	....	83	33	84	34	71	27	....	State weather service.
94	70	90	27	88	45	....	....	....	....	....	Do.
101	70	97	50	88	42	82	26	74	21	81	Do.
81	48	80	33	58	81	60	6	52	— 2	104	Joseph Wood.
78	54	69	88	56	35	63	9	48	1	98	New England Meteorological Society.
80	44	77	29	64	27	64	4	52	— 4	....	Do.
87	51	74	31	54	26	70	1	52	0	109	Silas West.
79	47	71	36	62	31	64	5	52	— 3	100	Signal Service.
83	42	74	26	59	26	....	....	48	— 6	....	New England Meteorological Society.
85	48	76	34	60	30	66	1	52	2	110	H. Richards.
82	47	73	31	59	28	68	3	50	— 3	106	Wesleyan Seminary.
86	50	75	34	58	30	69	6	52	0	111	New England Meteorological Society.
80	45	74	28	56	23	58	— 4	....	....	....	Do.
83	45	75	30	60	27	65	3	61	— 3	113	State College.
74	50	68	42	57	33	58	9	46	1	....	New England Meteorological Society.
85	48	78	33	61	29	67	7	57	2	108	Signal Service.
96	55	84	39	74	36	74	25	58	16	87	Do.
93	56	83	43	71	31	76	28	64	14	....	Albert E. Acworth.
90	48	80	36	72	32	76	20	58	12	90	E. T. Shriver.
93	49	80	36	....	....	70	21	55	13	....	Prof. G. G. Curtis.
96	52	....	87	66	35	....	18	48	10	......	John T. De Sellum.
....	....	....	[d]46	62	42	....	28	61	15	....	Henry Parr.
....	....	80	39	73	36	72	25	64	18	....	J. E. Mogue.

Table of maximum and minimum temperature and

States and Stations.	January.		February.		March.		April.		May.		June.		July.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Maryland—Continued:	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Great Falls	52	9	59	9	71	12	88	32	89	43	98	55	92	60
Jewell	......	......	......	......	......	......	......	......	......	......	......	......	......	......
McDonogh	50	5	54	8	67	10	85	32	84	43	92	54	90	58
Fort McHenry	49	7	55	10	71	10	82	32	84	41	93	53	92	57
Mt. St. Mary's	......	......	49	7	70	10	86	32	83	44	94	42	94	50
Woodstock	54	4	58	6	70	— 4	89	27	90	31	96	44	91	50
Massachusetts:														
Amherst (1)	43	—17	46	—19	50	2	84	17	82	28	94	38	86	48
Amherst (2)	41	—22	48	—16	49	— 3	84	15	80	26	94	38	86	46
Beverly Farm	48	—18	45	—11	47	5	61	16	69	29	90	45	86	50
Blue Hill (summit)	55	—11	52	— 7	54	8	77	17	82	31	93	47	86	50
Blue Hill (base)	57	—10	53	— 4	56	9	79	19	82	29	93	44	85	48
Blue Hill (valley)	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Boston	57	— 6	56	— 4	58	10	66	21	77	35	96	49	89	51
Cambridge (1)	54	—10	48	— 5	54	11	74	20	77	36	92	47	85	51
Cambridge (2)	55	— 6	51	— 4	55	12	72	19	78	32	94	47	86	51
Chestnut Hill	56	—10	51	— 5	54	10	76	20	79	32	96	43	86	48
Concord	54	—14	55	— 5	54	7	......	......	......	......	......	......	......	......
Cotuit	50	— 6	50	— 2	58	12	62	20	76	33	88	44	87	48
Deerfield (1)	40	—23	47	—22	51	— 3	86	14	83	27	96	37	86	43
Deerfield (2)	40	—21	50	—16	58	3	88	22	82	34	97	52	89	54
Dudley	54	—14	50	—10	43	13	84	17	83	29	93	42	88	50
Fall River (1)	55	— 5	50	1	52	10	70	22	87	30	96	45	85	52
Fall River (2)	55	—19	51	— 5	51	10	71	22	78	31	......	......	86	52
Fitchburg (1)	39	—10	52	— 7	51	9	78	20	80	34	93	50	84	54
Fitchburg (2)	40	—11	52	— 7	52	10	77	21	79	38	92	52	84	55
Framingham	53	—19	51	— 6	52	6	80	19	83	31	96	39	87	45
Gilbertville	50	—21	48	—14	54	— 1	87	12	......	25	93	......	86	44
Groton (1)	44	—14	53	—10	52	5	80	17	80	28	94	43	85	49
Groton (2)	......	—14	58	—13	......	......	......	......	85	......	......	......	......	......
Heath	38	—14	46	—16	[f]60	[d]2	78	10	80	34	......	......	......	......
Lake Cochituate	55	—26	57	—12	54	1	85	15	85	25	97	34	90	42
Lawrence	48	—14	52	— 8	52	7	82	16	88	29	95	44	90	51
Leicester	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Long Plain	50	—14	50	— 6	52	8	70	22	83	33	91	50	82	50
Lowell (1)	49	— 9	52	— 6	54	10	......	......	......	......	......	......	......	......
Lowell (2)	51	—15	50	— 8	52	6	81	19	80	30	94	44	86	51
Ludlow	47	—21	48	—14	50	— 4	85	12	78	25	95	34	85	45
Lynn	52	— 5	50	— 4	52	13	64	21	72	34	92	46	85	50
Mansfield	51	—18	50	— 6	56	7	78	17	83	31	95	39	89	43
Middleborough	51	—11	51	— 3	54	9	74	12	83	30	94	41	86	41
Milton	53	— 8	52	— 4	55	10	70	27	79	34	96	46	86	44
Monson	53	—17	52	—12	55	— 3	86	14	82	25	......	......	87	43
Nahant	......	......	......	......	......	......	......	......	......	......	93	42	87	52
Nantucket (1)	52	— 4	51	— 1	54	15	62	27	70	37	80	43	78	51
Nantucket (2)	51	— 4	46	1	55	11	66	25	74	35	87	45	82	51
New Bedford (1)	50	— 9	50	— 5	56	8	66	20	83	30	90	46	86	50
New Bedford (2)	54	— 7	51	— 2	57	10	65	21	81	31	94	43	88	47
Newburyport	54	— 7	54	— 5	54	11	77	18	77	33	97	44	87	51
Northampton	40	—23	46	—17	51	3	89	18	80	31	97	40	88	51
Plymouth'	54	— 4	56	— 2	56	12	68	26	......	......	98	50	86	56
Princeton	......	......	......	......	49	2	78	14	......	......	89	41	81	48
Provincetown	49	0	50	4	43	13	66	24	73	36	91	47	90	49
Rowe	42	—14	44	—15	46	0	73	12	78	32	89	38	84	44
Salem	42	— 8	50	— 4	50	13	......	......	72	32	90	52	88	58
Somerset	53	—10	52	— 5	56	7	81	18	84	30	100	48	92	50
South Hingham	......	—14	......	— 6	......	7	......	14	......	31	101	36	......	42
Springfield	41	—11	47	— 7	51	8	86	22	80	32	97	46	89	53
Swampscott	......	......	......	......	......	......	......	......	......	......	93	......	86	52
Taunton (1)	57	— 9	54	— 2	55	11	80	20	......	......	......	......	91	46
Taunton (2)	56	— 8	53	— 3	57	10	80	20	83	30	98	42	88	46

annual range of temperature, etc.—Continued.

August.		September.		October.		November.		December.		Annual range.	Authority.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
°	°	°	°	°	°	°	°	°	°	°	
92	52	83	36	72	32	74	22	58	15	89	Washington water-works.
....	....	77	43	71	38	....	28	56	17	....	Joseph Plummer.
93	55	77	39	65	35	71	22	56	13	88	McDonogh Institute.
91	56	81	46	72	37	72	22	54	15	86	U. S. post hospital.
93	41	79	38	69	33	71	15	50	11	....	Mt. St. Mary's College.
97	46	82	35	70	29	72	18	68	12	101	Woodstock College.
86	43	76	25	64	26	70	6	58	4	113	Miss S. C. Snell.
87	42	77	30	66	26	71	6	56	4	116	Massachusetts agricultural experiment station.
85	48	75	31	64	27	64	9	51	— 1	108	New England Meteorological Society.
88	48	76	34	64	27	69	9	57	2	104	Do.
88	48	77	31	65	29	71	12	59	4	103	Do.
91	44	79	29	67	27	72	13	58	5	....	Do.
88	52	80	36	69	34	74	13	60	5	102	Signal Service.
85	51	75	32	63	31	68	10	57	4	102	Harvard College Observatory.
89	52	78	32	67	31	68	10	58	4	100	New England Meteorological Society.
89	49	78	30	68	26	72	11	58	4	106	Do.
....	....	....	....	....	....	....	....	....	....	....	Do.
86	50	80	34	66	28	65	20	55	8	94	Do.
89	46	79	26	66	26	72	4	54	2	119	Rev. A. Hazen.
90	50	80	32	66	28	73	5	54	4	118	New England Meteorological Society.
92	45	76	30	66	26	71	7	58	0	107	Conant Observatory.
86	50	78	34	63	30	65	14	55	7	101	C. V. S. Remington.
....	....	78	33	65	29	66	12	58	5	....	New England Meteorological Society.
88	51	79	35	63	31	68	7	54	1	103	Do.
85	51	79	35	63	30	70	9	55	0	103	Do.
92	46	78	27	67	28	72	8	58	4	115	Do.
90	42	79	24	63	24	65	2	57	— 2	114	Do.
87	48	78	29	64	28	68	5	56	2	108	Do.
....	....	....	....	65	23	74	7	....	....	....	Do.
94	46	80	24	h64	24	66	2	48	— 8	....	B. B. Cutler.
95	40	82	22	69	21	75	7	62	1	123	New England Meteorological Society.
90	48	78	31	65	30	70	9	55	1	109	Do.
....	....	....	....	62	30	68	9	56	— 1	....	Do.
86	50	78	32	64	27	78	8	52	6	105	Do.
....	....	....	....	....	....	....	....	....	....	....	Do.
87	51	78	29	65	29	69	10	56	3	109	Do.
88	38	76	25	65	22	68	6	56	2	116	Do.
84	50	76	34	65	32	66	12	54	4	97	Do.
90	45	80	26	64	24	68	11	55	5	113	Do.
88	46	79	26	64	24	68	14	59	6	105	Do.
90	48	77	33	66	31	67	15	59	6	104	Rev. A. K. Teele.
88	41	76	24	65	23	70	2	59	— 2	....	New England Meteorological Society.
88	51	77	35	....	....	....	....	....	....	....	Wm. D. Hodges.
81	57	75	41	64	35	64	26	52	12	85	Signal service.
85	51	80	34	....	....	....	....	....	....	....	New England Meteorological Society.
82	50	77	34	64	29	62	15	52	4	99	Thomas R. Rodman.
86	50	79	32	64	28	64	16	55	8	101	New England Meteorological Society.
87	49	80	31	66	30	72	11	58	3	104	T. V. Pike.
90	47	78	32	64	28	68	8	52	5	120	New England Meteorological Society.
87	56	82	40	71	34	68	23	59	7	....	Do.
84	42	74	30	61	25	66	4	54	2	....	Do.
88	55	76	36	65	33	62	20	52	10	91	John R. Smith.
84	48	80	28	65	27	66	1	52	— 4	104	New England Meteorological Society.
88	53	78	32	66	33	70	14	59	3	98	Do.
94	49	86	32	71	26	68	14	58	6	110	Elisha Slade.
....	44	....	24	....	....	....	9	....	3	....	New England Meteorological Society.
89	50	77	28	65	30	71	8	56	4	108	U. S. post hospital.
85	50	77	33	65	32	....	....	....	....	....	New England Meteorological Society.
92	48	84	30	68	28	70	15	58	6	....	Dr. E. U. Jones.
90	47	79	29	66	27	69	14	58	5	106	New England Meteorological Society.

Table of maximum and minimum temperature and

States and stations.	January.		February.		March.		April.		May.		June.		July	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Massachusetts—Cont'd.	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Taunton (3)	57	—15	54	— 2	56	9	77	16	86	28	97	37	88	41
Vineyard Haven	60	— 7	51	— 3	58	12	66	25	74	26	92	50	86	52
Warwick	48	—16	46	—17	49	— 1	81	11	77	28	88	38	81	49
Wellesley	56	—23	51	— 6	51	6	82	17	83	27	95	38	86	43
Westborough	53	—15	55	— 8	56	7	85	18	86	30	98	43	93	47
Williamstown (1)	48	—17	47	—14	50	— 7	80	12	76	26	88	34	83	32
Williamstown (2)	48	—17	47	—14	52	— 7	......	......	76	26	88	37	83	32
Wood's Holl	53	— 4	48	0	52	13	61	24	69	37	77	52	78	52
Worcester (1)	52	— 8	52	— 5	52	8	82	20	81	34	94	43	88	51
Worcester (2)	52	— 8	52	— 5	58	8	......	......	......	......	94	42	85	52
Michigan:														
Adrian	39	—14	48	—13	72	— 7	86	21	85	22	98	34	95	43
Albion	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Alma	38	—22	49	—26	66	— 1	82	19	82	23	94	35	94	43
Alpena	37	—16	48	—23	49	—10	71	10	72	27	87	35	88	46
Atlantic	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Bad Axe	38	—16	44	—21	70	0	84	20	81	31	95	40	91	42
Battle Creek	......	......	......	......	......	......	......	......	......	......	98	41	94	48
Bear Lake	36	—21	44	—25	52	—13	79	10	78	20	92	32	94	42
Bell Branch	......	......	52	—14	73	— 6	......	......	86	28	100	47	98	52
Benton Harbor	38	2	46	—15	64	5	......	......	82	32	93	45	90	57
Benzonia	34	— 9	45	—20	52	—12	78	13	75	24	94	33	92	46
Berlin	......	......	......	......	......	......	......	......	......	......	......	......	92	50
Big Rapids	36	—29	44	—20	59	— 5	81	15	82	24	96	31	91	44
Birmingham	40	—14	45	—18	65	—11	84	18	80	22	96	35	94	43
Bronson	......	......	......	......	......	......	84	22	80	30	95	39	90	46
Buchanan	43	— 9	42	—12	65	3	79	24	79	32	88	40	88	51
Calumet	28	—18	38	—28	36	—14	60	9	67	23	86	35	88	45
Cassopolis	42	— 8	46	—12	67	4	81	25	80	32	94	42	93	51
Central Mine	38	—22	47	—32	......	......	......	......	......	......	94	42	......	......
Charlevoix	33	—22	......	......	50	—16	65	5	68	23	81	38	92	43
Chase	34	—31	48	—25	57	—12	81	9	83	22	95	30	91	44
Chelsea	40	— 8	45	—12	65	1	84	18	[d]80	[d]26	94	38	92	42
Coldwater	46	— 7	......	......	68	3	82	24	80	31	95	42	91	51
Colon	38	— 8	46	—14	68	6	84	23	82	36	95	46	90	56
Columbia	......	......	......	......	......	......	......	......	......	......	......	......	94	54
Concord	40	— 5	43	— 9	68	5	83	22	85	28	93	42	94	50
Corunna	39	—11	48	—18	69	4	81	18	88	23	94	33	91	40
Deer Lake	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Detroit	42	— 3	46	— 7	65	2	82	23	79	30	94	45	91	50
East Saginaw	......	......	......	......	......	......	......	......	......	......	......	......	......	......
East Tawas	34	—20	42	—20	52	— 5	67	16	79	28	[j]83	[j]38	......	......
Eden	42	—12	47	—17	67	— 5	......	......	83	28	95	42	92	49
Escanaba	36	—29	40	—28	43	—16	61	10	73	20	87	36	92	46
Evart	......	......	47	—25	61	— 9	90	9	86	22	99	29	99	42
Fletcher	34	—26	48	—22	60	—20	......	......	85	[j]30	100	30	100	51
Fort Brady	29	—34	38	—35	37	—23	68	— 7	74	25	87	31	90	40
Fort Mackinac	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Fremont	......	......	......	......	......	......	......	......	[c]84	[c]35	......	......	......	......
Gaylord	32	—31	46	—28	52	—27	80	— 5	83	26	94	29	93	42
Grand Haven	40	— 5	44	— 7	64	1	74	23	78	30	90	39	84	49
Grand Rapids	38	— 8	46	—10	......	......	......	......	......	......	......	......	......	......
Greenville	38	—21	46	—18	66	0	84	19	......	......	......	......	......	......
Gulliver Lake	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Hanover	43	— 5	44	— 9	66	3	79	24	80	31	92	41	88	48
Harrisville	38	—20	46	—26	48	—10	80	11	76	22	96	29	92	40
Hart	44	—15	50	—27	57	— 5	85	15	88	18	101	30	100	45
Hartford	40	0	41	— 2	64	3	90	20	86	32	97	38	......	......
Hastings	43	—14	46	—12	66	4	85	21	80	28	96	40	90	48
Highland	37	—14	44	—16	......	......	......	......	......	......	......	......	......	......
Hillman	38	—26	46	—29	53	—17	89	4	83	22	99	29	99	41
Hudson	37	—11	44	—15	68	— 4	82	19	85	19	96	28	94	35
Ionia	......	......	......	......	......	......	......	......	82	30	96	39	94	38
Jonesville	41	— 6	45	—11	66	3	82	24	81	30	......	......	......	......
Kalamazoo	42	— 4	46	— 8	67	4	82	25	80	33	91	41	90	50
Lansing (1)	39	— 9	46	—12	70	2	82	22	82	29	96	40	92	48
Lansing (2)	37	—16	44	—16	68	0	80	21	80	27	92	41	88	48
Lathrop	......	......	37	—34	48	—32	68	2	80	20	96	27	98	44
Mackinaw City	35	—19	39	—24	42	—11	......	......	......	......	......	......	......	......
Madison	39	— 9	45	—11	68	0	86	26	80	30	97	40	95	50
Manistee	......	......	......	......	......	......	......	......	......	......	......	......	90	50
Maple Hill	30	—32	35	—34	42	—20	78	2	74	24	94	30	88	39
Marshall	38	—10	45	— 9	68	4	84	24	84	30	99	41	93	50
Marquette	29	—21	40	—27	40	—14	62	14	76	22	94	35	90	47

annual range of temperature, etc.—Continued.

August.		September.		October.		November.		December.		Annual range.	Authority.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
°	°	°	°	°	°	°	°	°	°	°	
90	42	79	25	66	24	68	11	58	5	112	New England Meteorological Society.
87	56	80	40	69	33	68	23	57	6	99	Signal Service.
82	42	73	27	61	26	67	2	53	— 2	105	New England Meteorological Society.
91	45	79	30	66	23	71	9	58	3	118	Do.
95	50	82	28	70	30	75	14	60	6	113	G. S. Newcomb.
88	30	75	30	62	27	66	5	49	— 2	105	William's College Observatory.
84	30	....	....	....	....	....	....	....	....	....	New England Meteorological Society.
79	56	76	39	63	34	61	24	55	8	83	Signal Service.
88	50	76	31	65	30	72	10	56	1	102	J. B. Hall.
....	....	79	31	....	....	....	....	61	3	....	New England Meteorological Society.
96	38	92	29	75	24	76	15	55	6	112	State weather service.
....	....	90	38	72	30	73	22	54	15	....	Do.
90	35	87	30	72	23	71	14	50	8	120	Do.
90	39	82	32	66	26	67	12	47	5	113	Signal Service.
98	40	78	32	60	23	54	10	....	....	....	State weather service.
92	36	....	....	....	....	....	....	....	....	....	Do.
92	42	....	....	....	....	....	....	....	....	....	Do.
82	40	79	30	60	26	66	16	45	9	119	Do.
98	46	....	....	72	22	72	19	54	4	....	Do.
90	43	81	43	....	....	64	19	53	16	....	A. J. McClave.
81	43	76	35	61	28	65	15	49	13	114	State weather service.
98	42	88	31	70	22	73	16	51	2	....	Do.
86	38	81	28	67	22	68	7	48	10	125	Do.
96	35	88	27	71	21	72	18	52	3	114	S. Alexander.
92	37	90	30	58	30	72	18	50	10	....	State weather service.
90	45	95	38	72	31	72	18	52	10	107	Do.
92	42	72	36	57	26	54	10	44	7	120	Do.
92	45	86	37	72	30	73	21	51	17	106	Do.
....	....	....	....	....	....	....	....	....	....	....	Do.
79	38	72	40	....	....	....	....	....	....	....	Do.
88	36	80	25	....	....	66	5	48	9	....	Do.
....	....	87	30	70	30	70	20	53	10	....	Do.
93	45	87	37	72	29	....	....	....	....	....	Do.
92	48	86	32	73	28	72	19	48	14	109	Do.
94	50	82	40	....	....	....	....	54	18	....	Do.
....	....	88	35	72	26	72	18	52	12	....	Do.
90	37	87	32	73	24	73	12	52	8	112	Do.
90	38	81	31	62	24	70	6	48	10	....	Do.
91	46	84	35	72	30	70	22	55	13	101	Signal Service.
....	....	....	....	72	26	78	16	50	8	....	State weather service.
....	....	....	....	....	....	72	8	....	....	....	Do.
90	40	88	36	71	26	72	16	51	8	112	Do.
94	40	88	28	72	24	59	8	48	11	123	Signal Service.
90	38	....	....	....	....	....	....	....	....	....	State weather service.
92	34	86	30	64	24	62	6	45	3	126	Do.
82	32	73	30	63	21	48	0	43	— 3	125	U. S. post hospital.
....	....	....	....	66	28	55	12	44	4	....	Do.
86	44	....	....	66	30	62	20	47	17	....	State weather service.
88	31	74	28	....	....	60	—2	....	....	....	Do.
80	46	74	37	64	30	72	18	50	17	97	Signal Service.
88	41	82	35	71	26	71	17	50	11	....	State weather service.
....	....	....	....	....	....	....	....	....	....	....	Do.
....	....	....	....	60	23	53	11	42	5	....	Do.
90	43	84	36	70	28	72	19	53	13	101	Do.
90	36	86	28	65	26	64	10	49	1	122	Dr. D. W. Mitchell.
90	38	85	30	72	25	68	14	52	17	128	State weather service.
....	....	....	....	....	....	....	....	....	....	....	Do.
88	42	83	35	71	28	70	18	51	13	.110	Do.
....	....	92	38	72	30	68	20	48	8	....	Do.
92	32	88	27	....	....	60	1	47	1	128	Do.
97	25	86	15	73	20	74	15	53	5	112	Maj. A. H. Boies.
90	28	85	23	72	25	70	13	49	10	....	State weather service.
....	....	....	....	....	....	....	....	....	....	....	Do.
91	46	83	39	70	33	68	22	52	12	99	W. A. Black.
90	39	87	33	73	25	72	15	51	10	108	Signal Service.
89	39	86	33	73	26	71	14	51	8	108	Dr. H. B. Baker.
96	30	84	22	64	22	54	3	43	2	....	State weather service.
....	....	....	....	....	....	....	....	....	....	....	Do.
94	40	88	38	72	27	74	18	54	7	108	Do.
82	45	77	36	61	28	69	14	49	14	....	Signal Service.
....	....	....	....	....	....	....	....	....	....	....	State weather service.
94	44	88	36	73	27	72	19	50	15	109	G. H. Greener, M. D,
94	42	83	36	66	29	59	10	47	10	121	Signal Service,

Table of maximum and minimum temperature and

States and stations.	January.		February.		March.		April.		May.		June.		July.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Michigan—Continued.	°	°	°	°	°	°	°	°	°	°	°	°	°	°
May	34	—14	40	—20	62	— 3	80	24	79	32	92	45	91	55
Mio	35	—30	50	—24	58	—12	85	9	85	28	96	32	94	45
Mottville	38	—13	45	—20	69	4	84	21	82	30	92	39	92	49
Mount Morris	38	—17	43	—22	68	— 1	86	26	82	22	94	37	94	43
Mount Pleasant	......	......	......	......	......	......	......	......	......	......	......	......	89	48
North Marshall	......	......	42	—10	51	2	81	22	......	......	......	......	90	46
Olivet	38	— 6	45	—10	69	2	80	24	80	31	[k]89	[k]42	......	......
Omer	42	—28	52	—32	60	—15	90	12	84	23	102	40	98	40
Ovid	38	—16	43	—19	68	3	81	21	81	26	93	41	......	......
Paw Paw	42	— 4	50	— 9	65	4	82	22	......	......	......	......	......	......
Petersburgh	40	— 6	47	— 7	71	— 1	85	24	84	24	95	38	93	45
Petoskey	......	......	40	—23	......	—16	70	10	......	......	......	......	......	......
Pontiac	40	— 5	45	—10	64	4	78	22	76	30	86	44	85	51
Port Huron	44	— 7	48	—13	61	— 4	82	20	80	28	93	37	89	49
Pulaski	37	—10	44	—13	70	5	83	26	84	33	96	43	93	57
Romeo	43	— 8	44	—13	64	1	82	21	77	31	......	......	......	......
St. Johns	38	— 9	45	—17	68	2	83	22	81	27	93	42	92	49
St. Louis	38	—15	45	—19	66	0	82	22	83	28	97	39	95	49
Sand Beach	38	— 9	43	—19	......	......	......	......	......	......	89	32	88	47
Sault de Ste. Marie (1)	......	......	......	......	......	......	......	......	......	......	......	......	88	44
Sault de Ste. Marie (2)	30	—36	38	—36	38	—20	71	—13	74	23	91	28	......	......
Snowflake	34	—12	49	—25	53	—21	......	......	......	......	......	......	......	......
Thornville	38	—14	47	—16	66	— 7	85	22	83	25	92	41	90	50
Traverse City (1)	35	—23	48	—26	59	—17	88	9	81	22	98	33	97	45
Traverse City (2)	......	......	......	......	......	......	......	......	......	......	92	33	94	48
Washington	......	......	......	......	......	......	......	......	......	......	......	......	......	......
West Branch	37	—22	47	—23	57	—10	81	10	[c]78	[c]28	96	31	92	46
Williamston	38	—10	48	—10	68	4	80	28	78	32	90	40	90	52
Ypsilanti	......	......	......	......	......	......	......	......	......	......	......	......	95	44
Minnesota:														
Alexandria	36	—43	36	—44	35	—23	70	7	67	23	88	40	......	......
Argyle	......	......	......	......	39	—26	74	— 4	76	15	94	24	92	46
Delano	37	—52	......	......	46	—15	......	......	76	26	90	36	92	49
Duluth	37	—34	50	—32	45	—14	67	18	70	25	85	38	89	45
Farmington	......	......	......	......	48	—14	80	24	78	30	90	42	98	52
Fort Snelling	36	- 46	41	—39	44	—16	78	17	79	24	89	39	94	52
Glenwood	38	—40	39	—40	43	—18	70	11	74	27	95	42	......	......
Grand Forks	......	......	......	......	......	......	......	......	73	20	95	25	......	......
Grand Meadow	37	—33	......	......	47	—14	74	20	80	28	94	36	100	53
Lake Winibigoshish Dam.	......	......	46	—40	40	—23	......	......	69	25	......	......	85	56
Leech Lake Dam	......	......	48	......	44	—29	......	......	70	19	......	......	87	45
Le Sueur	39	—47	44	—35	40	—15	77	20	78	26	93	38	94	60
Mankato	37	—37	42	—32	47	—12	78	19	77	29	88	42	91	55
Medford	......	......	......	......	......	......	......	......	80	28	89	34	94	48
Minneapolis	34	—42	40	—35	42	—13	74	25	77	30	92	49	92	60
Moorhead	30	—44	38	—47	40	—20	76	7	71	20	98	28	95	48
Morris	32	—40	39	—40	40	—16	72	4	70	26	93	40	95	55
Northfield	34	—46	42	—34	43	—12	76	18	76	31	88	46	93	52
Pine River Dam	45	—52	47	—48	50	—30	77	10	76	27	96	44	97	58
Pokegama Falls	37	......	42	......	39	—30	73	1	70	12	......	......	85	41
Red Wing	32	—41	45	—30	44	—12	76	21	78	31	89	38	91	55
Rochester	......	......	43	—32	45	—12	74	24	77	28	......	......	83	56
Rolling Green	35	—33	39	—32	50	—10	71	20	76	28	90	48	93	62
St. Cloud	36	—44	47	—36	43	—15	75	17	73	25	......	......	......	......
St. Paul	34	—41	45	—33	42	—14	76	23	78	29	89	41	94	56
St. Vincent	36	—54	39	—50	41	—29	77	6	77	14	91	25	89	45
Sherburne	43	—38	40	—34	48	—12	......	......	......	......	......	......	......	......
Spring Valley	34	—42	43	—39	47	—15	74	18	81	24	95	30	95	48
Tracy	......	......	......	......	49	—14	82	12	76	20	......	......	......	......
Winona	34	—40	......	......	45	—13	74	22	......	......	......	......	......	......
Mississippi:														
Aberdeen	......	......	......	......	......	......	86	39	94	42	95	49	98	61
Artonish	78	16	74	30	79	32	88	50	92	52	94	61	98	67
Batesville	72	7	67	23	74	27	82	48	84	46	92	53	97	63
Biloxi	68	24	67	32	72	37	81	51	83	54	86	64	93	72
Brookhaven	......	......	......	......	......	......	86	43	93	45	96	55	104	63
Canton	......	......	......	......	......	......	......	......	......	......	......	59	......	......
Columbus (1)	......	......	......	......	......	......	92	34	98	47	102	51	104	65
Columbus (2)	......	......	......	......	......	......	92	34	98	46	102	51	104	65
Corinth	......	......	70	14	80	27	91	50	[k]90	[k]52	97	51	100	56
Edwards	75	18	......	......	86	29	86	46	91	49	95	57	96	63
Greenville	74	17	......	......	76	32	86	47	86	52	91	58	96	69

annual range of temperature, etc.—**Continued.**

August.		September.		October.		November.		December.		Annual range.	Authority.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
°	°	°	°	°	°	°	°	°	°	°	
91	44	82	30	69	30	69	16	48	9	112	State weather service.
88	33	83	29	65	24	65	6	50	— 2	126	Do.
94	40	89	88	75	27	75	16	51	10	114	J. A. Hartzler.
......	......	......	......	......	......	......	......	......	......	......	State weather service.
91	38	83	34	......	......	......	......	......	......	......	Do.
......	......	......	......	......	......	......	......	......	......	......	Do.
......	......	......	......	72	28	70	14	52	10	......	Do.
96	34	85	24	......	......	......	......	49	— 5	......	Do.
88	39	87	33	71	26	70	14	50	10	......	Do.
......	......	......	......	......	......	......	......	......	......	......	Do.
94	41	89	34	76	25	75	20	58	6	102	Do.
......	......	......	......	......	......	......	......	......	......	......	Do.
......	44	81	37	68	32	68	22	55	10	......	Do.
91	41	82	32	72	27	67	20	53	9	106	Signal Service.
93	50	87	38	72	31	73	20	52	13	109	State weather service.
......	......	......	......	......	......	66	22	......	......	......	Do.
90	42	89	35	72	26	71	17	50	10	110	Do.
......	......	......	......	......	......	......	......	50	9	......	Do.
91	45	85	31	72	30	66	18	52	6	......	Do.
82	40	76	32	60	22	56	1	42	— 2	......	Signal Service.
......	......	......	......	......	......	......	......	......	......	......	State weather service.
......	......	......	......	......	......	......	......	......	......	......	Do.
93	41	90	34	73	27	72	18	49	5	109	John S. Caulkins.
89	40	85	32	66	25	67	8	50	9	124	S. E. Wait.
86	42	81	33	64	28	......	......	51	9	......	State weather service.
......	......	......	......	67	25	73	17	50	6	......	Do.
86	36	81	30	......	......	63	7	47	2	119	State weather service.
......	......	90	38	72	38	68	20	50	10	......	Do.
95	38	88	30	72	24	72	16	52	4	......	J. C. Bemiss.
......	......	......	......	......	......	......	......	......	......	......	State weather service.
......	......	80	25	75	21	......	......	......	......	......	Do.
......	......	81	24	75	24	......	......	56	— 2	......	Do.
95	46	78	36	73	27	58	4	49	2	129	Signal Service.
94	48	82	34	......	......	72	6	58	6	......	State weather service.
......	......	......	......	......	......	......	......	......	......	......	Do.
92	42	85	29	76	27	67	3	59	3	140	U. S. post hospital.
97	35	81	22	......	......	......	......	48	— 6	......	State weather service.
98	42	80	28	73	26	70	10	53	0	......	Do.
89	49	76	38	71	25	55	2	41	—10	......	Do.
89	35	78	30	69	24	53	— 7	43	—14	......	Do.
93	45	81	24	70	25	70	1	52	— 1	141	L. B. Davis.
92	46	81	31	75	30	70	8	58	6	129	State weather service.
94	42	84	22	76	22	70	— 4	56	— 2	......	Do.
91	46	79	35	73	30	65	4	56	4	134	William Cheney.
95	33	87	26	77	20	65	— 3	54	— 5	145	Signal Service.
93	43	84	30	75	24	57	0	51	— 3	135	State weather service.
92	42	80	29	74	26	70	3	57	4	139	Do.
94	44	82	32	73	27	52	4	48	—18	150	Do.
91	31	78	23	69	18	54	— 9	47	— 19	......	Do.
92	47	80	28	71	30	68	5	54	9	133	Do.
92	44	80	24	......	......	60	3	......	......	......	Do.
90	52	84	32	72	29	65	12	53	4	126	Do.
......	......	80	32	75	27	59	3	......	......	......	Do.
94	46	81	31	75	28	66	6	58	5	135	Signal Service.
96	30	84	24	76	19	50	—7	43	—16	150	Do.
......	......	......	......	......	......	......	......	......	......	......	State weather service.
98	40	......	......	......	......	......	......	......	......	......	State weather service.
......	......	......	......	......	......	......	......	......	......	......	Do.
......	......	......	......	71	22	......	......	......	......	......	Do.
97	56	88	44	83	38	......	......	......	......	......	Signal Service.
97	70	92	52	86	45	86	30	76	26	82	State weather service.
95	63	85	48	77	41	......	......	68	20	......	Signal Service and State weather service.
90	72	87	56	80	51	79	37	63	28	69	Dr. R. G. Hinsdale.
99	67	94	48	88	41	......	......	......	......	......	Signal Service.
......	......	75	51	......	......	70	32	......	22	......	State weather service.
103	66	93	45	85	40	......	......	......	......	......	Do.
106	66	93	45	85	40	......	......	......	......	......	Signal Service.
102	58	87	38	•83	•29	......	......	......	......	......	Signal Service and State weather service.
98	69	90	49	85	43	......	......	......	......	......	Do.
96	70	......	......	......	......	......	......	......	......	......	State weather service.

Table of maximum and minimum temperature and

States and stations.	January.		February.		March.		April.		May.		June.		July.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Mississippi—Continued.	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Hazlehurst	......	......	......	......	......	......	88	43	92	46	98	55	100	62
Hermanville	76	16	72	28	81	28	......	......	89	60	......	......	......	......
Hernando	......	......	......	......	......	......	85	39	92	41	95	52	97	61
Holly Springs	......	......	......	......	......	......	85	40	90	43	94	52	98	62
Jackson (1)	......	......	......	......	......	......	[h]87	[h]46	92	47	[c]96	[c]55	97	62
Jackson (2)	......	......	74	24	80	30	87	47	90	52	92	60	94	66
Lake	......	......	......	......	......	......	86	46	92	52	95	51	101	64
Lamar	74	14	72	20	82	30	88	42	90	48	91	56	98	66
Logtown	......	......	......	......	......	......	......	......	......	......	88	64	93	72
Long Beach	......	......	......	......	70	50	84	53	87	54	......	......	......	......
Macon	......	......	......	......	......	......	89	41	96	42	100	55	102	65
Meridian	......	......	......	......	......	......	90	40	96	45	98	48	103	62
Natchez	......	......	......	......	......	......	86	50	94	49	97	59	99	65
Okolona	......	......	......	......	......	......	91	41	94	44	100	50	100	62
Palo Alto	75	16	71	23	78	30	86	44	93	48	94	54	96	64
Pearlington	......	......	......	......	......	......	......	......	88	54	90	66	94	72
Port Gibson	......	......	......	......	......	......	89	43	92	46	95	54	98	60
Starkville	74	11	70	19	76	25	82	41	87	46	......	......	94	65
Tupelo	......	......	72	25	78	42	84	58	90	62	......	......	......	......
University (Oxford)	74	10	68	21	77	28	85	42	88	46	92	54	96	64
Utica	......	......	76	29	79	33	82	38	89	43	......	......	......	......
Vicksburg	78	18	74	28	84	31	85	46	89	50	93	60	97	65
Waynesborough	......	......	......	......	......	......	86	42	90	48	97	49	102	67
West Point	76	7	74	22	78	28	88	42	90	49	95	52	96	65
Missouri:														
Conception	46	—29	......	—17	75	1	84	23	76	35	88	53	94	62
Craig	48	—16	58	—12	80	8	87	35	84	38	95	57	98	70
Fayette	61	—18	66	— 5	79	12	89	29	86	35	......	......	......	......
Fox Creek	67	—12	66	— 4	82	12	85	30	84	36	88	50	93	68
Frankford	......	—17	54	— 8	60	5	......	32	......	[g]36	96	36	96	64
Glasgow	......	......	57	— 3	75	12	85	30	82	35	91	44	98	56
Harrisonville	56	—20	56	4	75	10	85	27	91	33	100	51	102	66
Ironton	62	—10	60	1	76	13	82	25	80	30	84	37	87	50
Kansas City (1)	......	......	......	......	......	......	......	......	......	......	......	......	97	64
Kansas City (2)	56	—22	64	— 4	78	14	91	28	85	35	98	47	101	60
Kirksville	50	—25	57	—14	72	6	82	28	84	34	92	48	96	61
Lamar	67	—12	69	7	84	14	83	31	84	37	90	47	98	60
Lamonte	......	......	......	......	......	......	......	......	......	......	......	......	106	63
Louisiana	58	—17	63	— 7	73	9	88	31	87	33	92	41	......	......
Maryville	44	—32	54	—12	68	3	85	27	75	36	......	......	......	......
Mexico	59	—16	63	— 3	......	7	84	32	85	42	98	50	101	62
Miami	58	—20	65	— 6	78	8	90	24	90	34	96	48	103	58
Mound City	......	......	......	......	......	......	83	20	88	38	......	......	......	......
Oregon	58	—26	62	—12	79	1	90	27	......	......	92	53	94	59
Ozark	64	— 5	66	8	71	14	88	32	88	34	94	54	......	......
Pierce City	66	—11	69	3	80	14	85	30	88	38	97	57	100	60
Princeton	48	—26	60	—12	76	4	83	35	84	38	94	55	104	65
St. Charles	66	—11	62	— 6	76	14	88	30	89	36	92	43	99	61
St. Louis (1)	68	—12	63	— 4	76	14	88	35	88	40	90	50	98	64
St. Louis (2)	66	— 9	61	3	74	16	86	38	86	42	90	48	100	64
St. Louis (3)	65	— 8	60	2	76	16	87	38	87	46	89	55	......	......
Sedalia	68	—21	73	— 4	80	12	90	28	89	37	96	46	103	63
Springfield (1)	67	—11	70	5	83	12	86	31	84	37	92	54	......	......
Springfield (2)	68	—11	69	5	83	13	84	31	82	34	92	50	99	62
Steelville	70	— 7	65	7	78	16	91	28	86	32	91	38	96	54
Warrensburgh	49	—18	57	— 2	74	13	88	25	87	42	......	......	......	......
Warrenton	51	—12	62	— 3	71	15	84	43	85	45	......	......	......	......
Westport	......	......	......	......	......	......	......	......	......	......	93	50	......	......
Montana:														
Assiniboine, Fort (1)	53	—38	49	—22	60	—26	80	15	77	31	91	32	102	44
Assiniboine, Fort (2)	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Custer, Fort (1)	54	—45	61	— 2	67	—26	81	25	80	31	94	37	108	45
Custer, Fort (2)	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Helena	56	—41	56	— 1	64	—13	78	28	78	32	90	40	99	46
Keogh, Fort	45	—65	50	—20	56	—38	87	26	76	31	100	33	106	55
Maginnis, Fort (1)	60	—39	60	— 5	60	—23	75	17	72	29	79	26	94	45
Maginnis, Fort (2)	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Missoula, Fort	48	—42	53	13	51	1	78	30	82	34	79	48	95	42
Poplar River	44	—57	42	—31	46	—35	84	— 4	79	23	101	32	97	45
Shaw, Fort	61	—38	58	— 4	66	—29	80	12	81	30	83	33	103	40
Virginia City	......	......	54	0	54	—14	75	17	78	29	90	37	96	42
Nebraska:														
Ashland	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Creighton	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Crete (1)	55	—28	68	—15	80	—13	87	26	83	32	93	46	100	56

annual range of temperature, etc.—Continued.

August.		September.		October.		November.		December.		Annual range.	Authority.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
°	°	°	°	°	°	°	°	°	°	°	
99	68	95	49	88	48	....	....	....	....	....	Signal Service.
....	....	....	....	....	....	....	....	....	....	....	State weather service.
98	59	85	47	85	40	....	....	....	....	....	Signal Service.
95	59	85	44	81	38	....	....	....	....	....	Do.
97	57	[j]89	[j]57	[c]82	[c]41	....	....	....	....	....	Do.
93	69	....	....	82	41	....	....	....	....	....	W. J. Brown, jr.
98	66	94	50	86	40	....	....	....	....	....	Signal Service.
....	....	80	52	78	46	78	30	66	20	....	State weather service.
91	73	90	55	87	51	80	36	68	28	....	Do.
....	....	....	....	....	....	....	....	....	....	....	Do.
101	60	95	44	85	38	....	....	....	....	....	Signal Service.
103	65	90	44	86	38	....	....	....	....	....	Do.
94	70	90	48	87	42	....	....	....	....	....	Do.
101	63	90	46	83	38	....	....	....	....	....	Do.
96	64	87	48	84	40	80	29	68	21	80	W. H. Hill.
90	70	88	56	82	51	80	38	66	30	....	State weather service.
99	66	92	44	88	49	....	....	....	....	....	Signal Service.
92	64	....	....	80	40	77	31	63	20	....	State weather service.
....	....	....	....	....	....	....	....	....	....	....	Do.
97	62	86	48	81	42	78	28	65	19	87	Signal Service.
....	....	....	....	....	....	....	....	....	....	....	State weather service.
97	68	90	50	85	44	81	35	70	24	79	Signal Service.
97	67	90	48	86	45	....	....	....	....	....	Do.
96	65	....	....	....	....	....	....	....	....	....	State weather service.
94	55	89	44	80	26	76	18	59	13	123	Do.
....	....	....	....	....	....	....	....	....	....	....	Do.
....	....	80	61	84	27	80	20	65	12	....	Prof. T. Berry Smith.
92	54	84	42	82	34	82	24	58	16	105	State weather service.
....	48	....	[c]40	88	30	78	15	59	11	....	W. W. Vermillion.
98	50	92	38	83	30	79	20	66	10	....	State weather service.
....	....	89	39	....	....	78	21	60	8	....	Do.
88	45	80	28	79	24	74	17	62	18	98	Do.
97	56	92	41	85	35	78	26	60	14	....	Signal Service.
100	52	94	36	86	28	78	22	60	10	123	State weather service.
98	54	88	40	....	....	78	20	64	14	....	Do.
98	55	89	38	83	32	81	26	63	17	110	Signal Service.
108	59	....	....	89	32	85	28	69	16	....	State weather service.
....	....	....	....	....	....	....	....	....	....	....	Do.
....	....	....	....	....	....	....	21	57	10	....	Do.
97	56	....	43	....	32	79	22	60	16	....	Do.
100	56	94	38	....	....	....	....	....	....	....	Do.
....	....	....	....	....	....	....	....	66	1	....	Do.
....	....	92	38	82	29	78	20	63	0	....	Do.
100	56	85	36	82	28	81	22	53	16	....	Do.
103	57	92	33	84	28	83	26	61	18	114	J. J. Spilman.
106	55	80	40	84	30	78	19	63	12	132	William Hirons.
100	48	89	40	86	32	80	25	56	19	111	State weather service.
97	56	90	43	85	36	79	28	59	21	110	Signal Service.
99	56	92	43	86	36	78	28	58	20	109	State weather service.
....	....	....	....	....	....	....	....	....	....	....	Do.
103	55	....	....	84	32	80	22	66	15	....	Do.
100	54	90	40	....	....	....	....	....	....	....	Do.
97	54	89	40	82	33	79	27	60	18	110	Signal Service.
98	47	86	32	86	26	82	16	58	12	105	State weather service.
104	58	....	....	84	30	....	....	62	14	....	Do.
....	....	....	....	....	....	....	25	57	17	....	Prof. J. H. Frick.
97	55	89	39	....	33	....	....	....	....	....	State weather service.
96	43	93	33	79	16	61	— 6	61	— 8	140	Signal Service.
....	....	77	45	76	16	61	— 6	61	8	....	U. S. post hospital.
98	45	94	32	78	16	64	—12	54	— 9	148	Signal Service.
....	....	79	46	77	16	64	—12	54	— 9	....	U. S. post hospital.
93	42	89	41	75	21	57	— 4	53	—14	140	Signal Service.
98	43	93	46	78	14	58	—17	55	—19	171	U. S. post hospital.
92	38	89	33	75	18	59	8	60	4	133	Signal Service.
....	....	79	45	83	18	68	3	64	4	....	U. S. post hospital.
....	....	93	33	80	24	50	5	49	—18	....	Do.
97	37	91	29	77	19	62	— 4	60	—13	158	Signal Service.
97	39	92	33	83	18	60	— 4	60	— 7	141	U. S. post hospital.
91	41	92	38	72	16	48	— 1	48	— 9	....	Eugene Stark.
....	....	98	32	....	....	78	12	65	2	....	State weather service.
....	....	96	33	80	17	73	4	64	4	....	Do.
99	52	95	35	80	24	75	13	67	2	128	Signal Service.

Table of maximum and minimum temperature and

States and stations.	January.		February.		March.		April.		May.		June.		July.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Nebraska—Continued.	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Crete (2)	......	......	......	......	......	......	......	......	......	......	......	......	100	56
Culbertson	......	......	......	......	......	......	96	22	90	34	100	52	102	56
David City	......	......	......	......	......	......	......	......	......	......	......	......	......	......
De Soto	48	—36	56	—19	76	— 1	86	24	86	34	94	43	99	54
Fairbury	......	—32	......	—10	60	0	85	30	90	32	96	65	99	76
Falls City	50	—30	......	......	......	......	84	30	......	......	100	51	102	60
Fremont	48	—26	62	—15	76	—11	84	25	84	34	92	44	98	58
Genoa	54	—32	62	—20	73	—15	89	28	83	34	92	45	97	55
Hay Springs	55	—30	56	— 2	69	—14	85	23	79	29	99	37	101	52
Kimball	72	—33	67	10	74	— 9	85	21	84	27	102	40	105	45
Lincoln	55	—18	63	—16	79	—11	87	27	87	34	94	44	100	58
Marquette	51	—13	62	0	75	— 4	89	26	84	35	94	46	101	64
Minden	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Nebraska City	......	......	......	......	......	......	......	......	......	......	......	......	99	61
Niobrara, Fort	63	—36	65	— 9	71	—10	91	23	80	34	103	48	103	50
North Loup	36	—28	......	......	......	......	62	32	......	......	......	......	......	......
North Platte	6[illegible]	—35	68	— 4	74	—14	89	26	85	32	98	42	101	53
Omaha	51	—25	62	—17	78	— 4	86	28	84	37	96	46	101	60
Palmer	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Ravenna	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Robinson, Fort	66	—21	61	— 3	69	—10	85	16	81	26	......	......	101	48
Sidney, Fort	......	......	67	11	73	— 9	89	26	......	31	99	40	104	42
Syracuse	50	—25	......	......	......	......	84	37	82	44	92	56	98	64
Tecumseh	51	—30	61	—12	75	7	f 79	f 29	85	31	95	50	f 97	f 64
Valentine	63	—35	62	— 8	67	—15	88	23	77	32	100	41	103	49
Weeping Water	51	—36	62	—19	75	—15	86	17	......	......	......	......	......	......
West Hill	57	—29	......	......	......	......	......	......	......	......	......	......	......	......
West Point	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Nevada:														
Austin	......	......	51	12	......	......	79	22	......	......	88	35	93	25
Battle Mountain	50	—35	60	25	66	20	84	30	90	34	92	38	98	52
Beowawe	51	—37	58	21	70	18	85	35	89	43	89	45	100	61
Brown's	54	—25	60	26	73	24	92	42	92	49	98	54	105	58
Carlin	42	—65	46	8	65	20	89	30	......	......	94	48	102	56
Carson City (1)	58	—10	63	17	66	17	82	21	84	31	83	37	94	38
Carson City (2)	58	12	65	15	72	13	86	19	87	28	87	33	......	......
Dayton	......	......	67	18	72	17	87	26	85	35	......	......	......	......
El Dorado	......	......	......	......	......	......	......	......	......	......	......	......	113	69
Elko (1)	54	—40	54	10	64	20	90	36	88	48	92	50	102	64
Elko (2)	......	......	71	4	72	3	90	14	......	......	90	25	103	30
Ely	......	......	55	4	61	— 4	83	20	89	24	98	29	101	36
Eureka	......	......	......	......	......	......	87	17	86	21	95	38	100	46
Fenelon	46	—30	41	20	......	......	84	34	......	......	......	......	98	68
Genoa	......	......	62	12	68	12	......	......	......	......	85	37	......	......
Golconda	55	—25	......	......	......	......	92	40	......	......	100	50	105	60
Halleck	50	—50	58	0	68	— 1	90	30	......	......	94	46	104	50
Hawthorne (1)	58	— 8	64	21	74	30	84	34	92	42	102	54	104	60
Hawthorne (2)	......	......	64	18	70	21	84	29	......	......	......	......	......	......
Hot Springs	58	—31	54	18	65	7	88	25	83	38	91	50	......	......
Humboldt	52	—21	......	......	......	......	90	22	90	28	90	37	95	40
Lewer's Ranche	......	......	......	......	......	......	......	......	......	......	......	......	90	43
McDermit, Fort	55	—27	57	17	65	10	84	23	78	28	86	34	99	43
Montello	......	......	......	......	62	12	86	32	......	......	90	44	97	58
Palisade	48	—30	52	18	68	18	84	38	86	48	95	48	94	54
Pioche	......	......	56	12	65	8	82	28	86	31	94	36	96	40
Pyramid	......	......	......	......	......	......	......	......	90	28	92	37	95	42
Reno (1)	60	—10	62	18	70	41	82	32	86	40	84	44	97	54
Reno (2)	......	......	76	14	76	13	88	20	......	......	86	37	92	41
Ruby Hill	......	......	......	......	......	......	......	......	......	......	......	......	88	44
Stillwater	......	......	......	......	......	......	......	......	......	......	97	40	102	45
Tecoma	44	—32	58	25	65	20	82	32	89	40	96	48	101	56
Toano	46	—34	50	0	60	— 2	88	30	......	......	90	44	98	62
Tuscarora	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Wadsworth	56	—26	68	20	72	22	86	34	90	44	96	50	99	66
Wellington	......	......	......	......	......	......	72	22	76	28	83	29	86	40
Wells	35	—44	......	......	......	......	......	......	......	......	......	......	......	......
Winnemucca (1)	50	—28	63	17	71	10	83	21	90	23	88	39	96	40
Winnemucca (2)	45	—24	......	......	66	16	86	32	85	40	85	50	98	35
Winnemucca (3)	......	......	63	13	70	10	88	21	90	23	90	37	101	37
New Hampshire:														
Berlin Falls	......	—31	51	—27	50	—23	74	— 5	79	18	94	27	88	36
Berlin Mills	45	—29	40	—25	50	—21	77	— 4	80	20	93	30	93	35
Chesterfield	......	......	......	......	......	......	82	6	79	32	......	......	......	......
Concord	40	—16	56	—12	56	2	86	15	81	29	94	42	85	49
Grafton	39	—25	50	—14	53	—10	......	......	......	......	......	......	......	......

annual range of temperature, etc.—Continued.

August.		September.		October.		November.		December.		Annual range.	Authority.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
°	°	°	°	°	°	°	°	°	°		
....	....	95	35	80	24	....	....	....	....	....	G. I. Gilbert.
103	52	100	30	86	18	80	6	70	— 2	....	Signal Service.
102	46	94	34	82	18	70	6	64	0	....	John R. Townsend.
99	48	93	82	77	27	77	14	63	3	135	Charles Seltz.
98	....	....	....	....	....	....	....	....	....	....	Dr. I. Humphrey.
100	54	94	37	80	26	77	18	62	2	....	A. B. Newkirk.
98	51	94	36	78	22	75	12	65	2	124	Isaac E. Heaton.
96	48	95	84	74	22	74	10	66	5	129	George S. Truman.
86	34	94	30	76	17	70	3	63	— 6	131	William Waterman.
95	43	95	29	79	14	71	1	65	— 5	138	William G. Barton.
100	50	94	34	80	20	75	15	66	5	118	University of Nebraska.
100	52	96	31	85	25	73	16	65	7	114	John Ellis.
....	....	....	....	76	30	68	14	62	0	....	State weather service.
....	....	94	33	77	26	76	15	62	1	....	Do.
95	40	98	29	83	12	56	4	54	— 4	139	U. S. post hospital.
....	....	92	31	82	17	72	9	64	— 7	....	State weather service.
98	44	96	31	80	20	75	9	67	— 3	136	Signal Service.
99	53	95	39	80	28	78	17	66	10	126	Do.
....	....	94	28	80	12	70	10	64	4	....	State weather service.
....	....	96	26	83	12	71	12	65	2	....	Do.
92	39	99	28	80	16	65	9	65	— 2	....	U. S. post hospital.
96	43	96	28	77	14	70	— 3	65	— 6	....	Do.
98	62	95	89	80	27	74	16	64	4	....	P. W. Risser.
100	53	93	32	76	23	74	13	60	— 5	130	W. L. Dunlap.
92	41	99	29	....	....	80	9	68	— 2	138	Signal Service.
....	....	....	....	83	22	75	9	65	— 6	....	G. Treat.
....	....	92	34	78	20	75	10	66	8	....	State weather service.
....	....	94	....	76	28	75	....	60	2	....	Do.
90	26	88	38	78	26	64	11	....	....	....	Do.
99	50	96	38	78	26	64	14	56	16	134	Pacific railway system.
98	67	98	60	80	28	65	7	54	8	137	Do.
104	62	102	54	83	28	66	12	57	22	130	Do.
....	....	94	48	86	26	63	0	45	— 2	....	Do.
90	42	89	41	80	22	68	16	58	22	104	Signal Service.
95	37	93	36	86	19	72	12	61	18	....	Prof. Charles W. Friend.
....	....	92	42	80	26	71	16	60	18	....	State weather service.
117	66	112	69	100	53	80	44	69	39	....	Do.
....	....	....	....	80	38	64	10	60	— 2	....	Pacific Railway system.
103	31	....	....	....	....	73	0	73	—10	....	State weather service.
96	37	91	36	....	....	60	7	....	....	....	Do.
98	55	94	49	76	25	62	18	54	— 1	....	Do.
96	68	....	....	78	28	....	....	44	— 2	....	Pacific Railway system.
90	45	89	40	79	28	65	18	57	24	....	State weather service.
....	....	....	....	75	38	75	20	75	10	....	Pacific Railway system.
....	....	102	36	82	24	60	6	54	—10	....	Do.
102	60	....	....	86	38	66	26	62	26	....	Do.
....	....	....	....	....	....	....	....	....	....	....	State weather service.
....	....	100	52	83	25	70	12	60	17	....	Pacific Railway system.
....	....	95	40	76	29	62	10	56	16	....	Do.
....	....	....	....	82	27	68	18	59	19	....	State weather service.
96	47	96	40	86	26	65	15	59	4	126	U. S. post hospital.
96	58	92	57	76	31	62	22	50	—10	....	Pacific Railway system.
99	68	92	52	75	29	60	12	50	8	129	Do.
96	41	93	38	82	24	....	....	57	2	....	State weather service.
....	....	96	30	....	....	....	....	....	....	....	Do.
94	51	91	48	78	31	68	21	65	26	107	Pacific Railway system.
....	....	93	42	83	26	69	17	....	....	....	State weather service.
81	42	78	33	....	....	....	....	....	....	....	Do.
103	40	....	....	....	....	....	....	....	....	....	Do.
105	60	96	54	80	32	58	24	55	0	137	Pacific Railway system.
....	....	90	50	74	30	56	10	52	— 8	....	Do.
98	42	96	35	73	18	60	5	56	— 7	....	State weather service.
....	....	....	....	....	....	59	15	50	16	....	Pacific Railway system.
89	44	....	....	....	....	60	17	49	11	....	State weather service.
....	....	....	....	83	27	62	0	80	—12	....	Pacific Railway system.
96	45	94	40	80	21	64	4	58	11	124	Signal Service.
101	54	....	....	75	32	77	82	72	11	....	Pacific Railway system.
98	42	96	37	81	20	....	....	....	....	....	State weather service.
86	35	77	18	71	8	74	— 8	50	—15	125	Appalachian Mountain Club.
86	38	77	21	66	21	....	— 9	60	—11	122	Q. A. Bridges.
....	....	80	28	....	....	67	— 5	49	—12	....	New England Meteorological Society.
89	45	76	28	64	26	74	3	54	— 4	110	W. L. Foster.
....	....	....	....	....	....	....	....	....	....	....	New England Meteorological Society.

Table of maximum and minimum temperature and

States and stations.	January.		February.		March.		April.		May.		June.		July.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
New Hampshire—Cont'd.	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Hanover	38	—26	46	—20	50	— 8	78	9	79	26	92	38	84	46
Manchester (1)	41	—15	54	—11	53	4	82	16	79	26	98	38	87	46
Manchester (2)	39	—16	56	—13	50	0	80	16	......	......	......	......	87	48
Manchester (3)	42	—11	54	—11	51	4	81	17	81	28	96	41	87	48
Mt. Washington	......	......	......	......	......	......	......	......	......	......	......	......	64	24
Nashua	41	—19	52	—12	52	1	83	18	83	27	98	39	88	45
North Conway	44	—21	50	—16	51	— 4	76	10	81	28	97	35	88	40
Plymouth	38	—20	48	—16	53	— 9	75	8	84	24	96	34	91	41
Shaker Village	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Shelburne	40	—44	50	—18	50	— 4	......	......	......	......	......	......	......	......
Stratford	41	—25	50	—23	63	—13	83	2	85	25	'99	34	94	41
Walpole	42	—20	53	—18	59	— 4	79	11	78	29	91	38	84	45
West Milan	40	—29	......	—28	54	—22	66	2	79	20	91	31	90	36
New Jersey:														
Atlantic City	53	2	55	3	70	10	74	30	74	40	90	50	91	55
Beverly	58	0	58	2	69	7	88	30	88	34	99	48	93	54
Billingsport Light-House.	56	4	56	4	68	10	86	34	83	45	94	56	86	60
Bordentown	56	2	57	1	70	6	92	28	86	33	97	38	......	......
Bridgeton	......	......	......	......	......	......	88	34	86	47	95	56	90	61
Cape May	......	......	......	......	......	......	......	......	......	......	......	......	92	54
Clayton	51	4	58	6	71	8	90	30	90	36	98	49	95	55
Egg Harbor City	54	1	53	3	68	4	86	26	90	33	96	45	92	50
Freehold	59	2	58	0	65	4	84	27	86	34	......	......	90	50
Gillette	57	6	52	1	64	0	86	26	82	30	99	40	94	47
Hanover	51	9	49	3	63	3	83	23	83	26	96	39	92	45
Highland	......	......	......	......	......	......	......	......	......	......	96	45	91	51
Imlaystown	57	2	55	0	66	4	90	28	86	34	94	46	92	52
Lambertsville	54	1	54	2	67	9	88	29	84	34	96	54	99	54
Locktown	51	5	52	3	64	3	88	24	90	31	94	43	92	52
Madison	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Moorestown	58	— 1	55	1	68	7	89	30	84	36	94	48	91	54
Newark	54	4	53	2	60	4	85	30	83	40	96	52	90	56
New Brunswick (1)	56	4	53	4	64	5	83	32	82	40	93	52	88	56
New Brunswick (2)	58	2	55	0	61	4	87	26	83	34	95	46	89	52
New Brunswick (3)	57	2	55	0	66	4	......	......	......	......	......	......	89	52
Ocean City	55	4	54	3	67	10	71	33	72	42	93	55	92	60
Oceanic	58	4	54	3	63	6	84	31	91	39	99	52	96	56
Paterson	53	1	50	1	59	4	85	29	84	34	96	42	......	......
Plainfield	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Princeton	56	1	53	0	65	5	86	29	83	37	95	50	......	......
Rancocas	57	2	55	0	68	5	90	29	86	37	98	51	......	......
Readington	52	2	56	2	72	6	88	30	82	46	102	56	94	64
Somerville	......	......	52	2	64	4	86	29	82	34	96	44	88	51
South Orange	56	0	50	2	62	4	86	26	84	32	96	43	89	53
Tenafly	55	12	54	5	62	2	92	22	84	28	104	40	95	45
Tom's River	55	0	53	4	69	5	78	25	83	32	93	45	89	49
Trenton	58	2	60	1	65	6	88	32	82	45	96	56	93	60
Union	55	1	50	0	61	3	82	28	81	44	94	53	88	56
Vineland	54	8	59	5	69	8	84	29	83	37	92	48	91	53
New Mexico:														
Bayard, Fort	71	22	71	27	75	24	80	39	89	51	94	56	94	65
Coolidge	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Deming	......	......	......	......	65	28	80	50	......	......	101	78	......	......
Gallinas Spring	62	7	65	25	74	24	80	39	84	42	96	53	95	63
Las Vegas	74	—10	70	10	69	3	79	32	86	30	93	42	90	51
Lava	63	10	66	20	76	23	85	38	94	40	107	55	107	61
Lordsburgh	66	20	70	30	76	32	85	46	95	85	98	58	......	......
Santa Fé	58	— 2	55	16	64	14	72	29	76	34	87	42	90	51
Selden, Fort	73	12	75	23	78	22	90	40	98	41	108	56	105	60
Stanton, Fort	62	— 3	65	16	66	10	74	31	80	33	92	43	89	51
Union, Fort	65	—19	63	11	66	14	74	28	77	34	88	42	95	48
Wingate, Fort	49	— 6	54	14	59	8	68	29	78	28	87	40	93	48
New York:														
Albany (1)	45	—10	48	—10	52	0	88	22	79	33	96	46	90	52
Albany (2)	44	—11	43	—10	46	1	86	28	......	......	......	......	......	......
Ardenia	54	— 7	50	— 3	54	5	86	31	79	43	96	54	91	61
Auburn	47	— 5	50	— 6	65	3	79	23	78	34	89	42	86	48
Boyd's Corners	49	—10	48	— 9	65	7	86	28	85	42	95	56	94	59
Brooklyn	54	1	52	2	62	4	77	31	79	42	97	51	......	......
Buffalo	49	— 6	51	— 8	63	2	66	21	81	33	86	45	84	49
Carmel	......	—16	......	— 9	63	4	85	19	81	27	96	40	90	47
Columbus Fort	53	0	47	2	64	6	78	29	78	39	94	51	89	55

annual range of temperature, etc.—Continued.

August.		September.		October.		November.		December.		Annual range.	Authority.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
°	°	°	°	°	°	°	°	°	°	°	
83	41	75	30	58	25	65	0	52	— 7	118	New England Meteorological Society.
90	44	78	26	66	26	73	3	57	1	113	
91	45	76	27	66	27	70	4	53	— 1	....	Do.
91	48	78	27	67	26	73	6	58	1	107	Do.
62	28	58	14	....	....	....	....	....	....	....	Signal Service.
91	45	80	26	67	25	71	5	57	1	117	Do.
91	44	78	27	61	23	....	....	69	— 3	118	Charles H. Webster.
92	40	78	24	58	22	69	2	52	— 6	116	New England Meteorological Society.
....	....	....	....	60	25	68	5	51	0	....	Do.
....	....	....	....	....	....	....	....	....	....	....	Nicholas A. Briggs.
98	41	82	26	63	22	70	— 2	58	— 8	124	New England Meteorological Society.
86	44	76	27	63	26	66	— 2	50	— 8	111	Do.
87	38	80	23	58	19	78	— 8	62	—14	120	Do.
											Do.
88	51	80	37	71	30	69	26	53	12	89	
94	48	84	39	68	30	75	17	60	11	99	Signal Service.
92	54	80	41	66	36	74	21	59	14	90	Charles F. Richardson.
											State weather service.
....	....	....	....	....	....	....	....	....	....	....	Do.
93	58	82	44	73	38	74	26	....	....	....	Do.
93	48	82	42	70	32	72	27	63	15	....	Do.
95	51	80	38	76	32	75	22	60	14	94	William T. Wilson.
95	47	82	36	71	27	74	22	62	12	95	H. Y. Postma.
92	44	83	36	72	30	77	18	61	6	....	State weather service.
96	48	82	32	67	27	77	12	65	7	98	Do.
90	41	81	29	64	25	66	8	51	5	93	Do.
93	49	82	36	68	29	72	14	57	7	....	Do.
95	49	83	38	69	30	77	17	60	10	95	Do.
93	53	81	43	....	....	71	18	57	13	98	Do.
94	47	81	38	....	....	71	13	55	8	91	Do.
....	....	83	34	70	27	71	13	55	6	....	Do.
93	50	82	38	66	31	75	17	63	10	95	Thomas J. Beans.
96	52	80	42	69	34	70	18	54	11	94	State weather service.
92	54	78	42	66	35	70	17	56	12	89	Do.
93	50	80	37	68	30	72	15	56	9	95	Do.
94	48	....	....	....	....	....	....	56	8	....	Do.
89	60	83	50	69	35	69	22	50	12	90	Do.
98	54	90	43	72	34	73	25	60	12	96	Do.
93	51	82	42	67	34	72	15	55	7	....	Do.
96	45	83	35	70	34	74	14	58	7	....	Do.
....	....	....	....	....	....	....	....	....	....	....	Do.
93	52	....	....	....	32	76	16	58	10	....	Do.
96	60	84	48	72	34	74	20	62	10	100	John Fleming.
92	47	81	40	66	31	71	15	57	9	....	State weather service.
92	50	81	38	66	30	73	15	54	7	96	Dr. W. J. Chandler.
98	45	83	30	70	27	77	10	62	6	102	State weather service.
92	46	96	35	71	30	71	25	61	10	93	Do.
94	55	82	40	71	37	76	20	66	10	95	Do.
91	54	79	42	66	31	70	15	53	8	94	Do.
92	49	92	49	66	31	72	21	65	16	89	Dr. O. H. Adams.
93	53	92	49	92	40	75	27	74	25	72	U. S. post hospital.
100	40	91	39	76	25	....	10	....	12	....	B. S. Mullin.
108	70	98	47	97	40	80	30	65	30	....	Pacific Railway system.
94	53	86	52	78	32	71	29	60	20	89	J. E. Whitmore.
94	50	83	44	74	24	68	4	59	— 2	104	F. W. Chatfield.
104	53	94	49	86	28	71	18	58	19	97	Signal Service.
98	68	....	....	80	40	78	30	60	27	....	Pacific Railway system.
90	40	82	43	72	30	64	12	52	16	92	Signal Service.
106	50	98	47	96	30	81	20	68	22	96	U. S. post hospital.
90	48	80	38	78	29	70	18	58	3	93	Signal Service.
91	46	81	30	73	25	65	5	60	6	114	U. S. post hospital.
89	40	82	42	75	23	60	14	53	— 5	99	Do.
90	49	80	36	65	30	69	8	53	— 2	106	Signal Service.
....	....	....	....	....	....	....	....	....	....	....	C. B. Tillinghast.
91	55	79	39	67	34	69	11	54	8	103	Richard B. Arden.
85	45	76	38	65	31	64	20	54	4	95	Geo. Casey.
93	55	79	38	63	34	70	10	55	7	105	Thomas Manning.
94	53	....	....	....	....	....	....	59	—12	....	Prof. W. C. Peckham.
85	50	80	36	66	31	68	15	55	4	94	Signal Service.
92	43	78	35	65	26	68	8	55	3	112	New England Meteorological Society.
93	52	82	41	68	34	69	17	55	9	94	U. S. post hospital.

Table of maximum and minimum temperature and

States and stations.	January.		February.		March.		April.		May.		June.		July.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
New York—Continued.	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Cooperstown	47	—12	47	22	56	— 9	80	18	76	35	88	45	88	52
David's Island	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Eden	......	......	......	......	67	2	84	23	77	36	94	45	88	50
Factoryville	45	—12	49	—20	62	— 1	85	21	81	26	91	34	89	42
Friendship	45	7	50	—10	72	— 4	86	20	80	32	98	40	89	50
Geneva	......	— 6	......	— 5	......	— 2	82	20	81	34	96	42	91	53
Hamilton, Fort	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Humphrey	42	—12	43	—12	56	— 5	80	23	79	34	90	39	89	50
Ithaca	48	— 8	51	—15	60	— 2	82	20	82	29	96	40	93	48
Le Roy	49	—10	54	—11	60	— 1	84	19	82	28	94	39	......	......
Lyons	......	......	......	......	......	......	......	......	80	37	92	43	89	50
Madison B'ks	43	—19	49	—18	58	— 7	69	17	82	26	88	37	91	40
Middleburgh	......	......	......	......	......	......	......	......	......	......	......	......	......	......
New York (1)	54	2	55	3	63	5	84	29	82	41	96	52	90	55
New York (2)	54	0	52	1	57	6	83	28	84	40	96	51	89	54
Niagara, Fort	48	1	50	— 3	62	2	82	22	77	32	91	43	83	52
North Volney	45	—11	......	......	49	— 9	77	25	78	34	......	......	......	......
Oswego	48	— 8	48	—10	50	— 1	72	19	77	32	88	41	89	48
Palermo	44	—13	47	—13	56	—11	76	16	80	25	81	36	90	41
Palmyra	48	— 9	48	— 8	......	......	85	29	81	......	97	52	92	54
Plattsburgh Barracks	45	—18	40	—16	45	0	79	6	83	16	96	32	90	37
Rochester	48	— 6	57	— 8	59	0	80	21	78	33	95	42	90	48
Rose	......	......	......	......	51	2	79	25	80	33	90	43	84	56
Savona	......	......	......	......	......	......	......	......	......	......	......	......	89	42
Setauket	56	2	53	2	55	9	81	29	77	37	94	47	87	53
Utica	40	—21	44	—21	51	— 8	83	17	85	31	98	36	96	34
Wadsworth, Fort	......	......	......	......	......	......	......	......	......	......	......	......	......	......
West Point	52	—15	49	— 9	53	0	83	29	76	39	96	49	92	50
White Plains	50	—17	48	— 4	53	5	83	22	77	27	88	54	81	64
North Carolina:														
Chapel Hill	75	16	72	14	78	20	94	34	96	43	c100	*50	......	......
Charlotte	73	17	71	16	79	20	91	38	94	40	98	55	100	60
Goldsborough	......	......	......	......	......	......	90	30	91	49	99	50	100	62
Hatteras	69	22	66	27	69	26	75	41	77	49	83	59	85	62
Hot Springs	71	14	66	9	73	21	81	33	88	34	94	47	92	60
Kitty Hawk	70	17	72	22	76	22	92	39	93	46	98	58	100	59
Lenoir	72	12	62	12	69	19	80	34	83	41	90	54	91	62
Lamberton	......	......	......	......	......	......	90	36	94	47	98	51	102	57
Monroe	......	......	......	......	......	......	......	......	......	......	94	56	99	60
Mount Pleasant	......	......	......	......	......	......	......	......	......	......	95	52	......	......
New Berne	......	......	......	......	......	......	90	39	91	46	98	54	99	59
Raleigh (1)	75	17	68	15	77	20	90	35	90	44	101	52	101	58
Raleigh (2)	78	19	72	20	79	26	90	37	91	48	98	60	97	63
Salisbury	......	......	......	......	......	......	......	......	......	......	95	62	100	66
Southport	64	19	64	24	75	24	77	40	84	51	90	54	92	62
Statesville	68	15	64	12	75	18	89	35	85	40	93	58	93	62
Tarborough	......	......	......	......	......	......	92	34	92	44	97	52	100	57
Wadesborough	......	......	......	......	......	......	90	35	91	41	97	52	98	60
Weldon (1)	......	......	......	......	......	......	95	30	94	40	100	49	100	53
Weldon (2)	72	13	73	18	76	17	91	32	91	41	96	50	98	52
Wilmington	75	20	72	25	76	24	88	37	86	51	94	53	96	60
Ohio:														
Akron	54	— 2	51	— 2	66	7	84	23	80	33	93	40	90	47
Athens	......	......	......	......	......	......	84	27	85	31	94	44	88	50
Bangorville	54	— 6	52	— 2	65	5	83	22	81	31	96	38	91	49
Bellevue	......	......	......	......	66	8	84	30	82	37	94	50	90	54
Canton	54	— 6	52	— 2	66	8	84	23	81	32	93	38	91	46
Celina	56	— 2	55	— 3	68	4	86	28	87	34	96	41	92	52
Cincinnati	64	6	61	6	71	12	84	33	88	39	96	48	95	58
Clarksville	59	4	55	6	68	10	82	32	82	35	94	43	92	54
Cleveland (1)	55	— 2	53	— 3	68	8	79	26	80	34	91	43	89	51
Cleveland (2)	55	— 2	53	— 3	68	8	79	26	80	34	91	42	89	51
College Hill	62	2	56	3	70	12	85	41	87	40	86	52	97	65
Collinwood	......	......	......	......	......	......	......	......	......	......	87	40	86	49
Columbus	59	2	55	4	70	6	84	30	82	38	97	45	91	53
Dayton	59	— 1	54	2	70	9	83	29	83	36	100	42	97	53
Demos	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Elyria	......	......	53	— 4	68	10	86	25	82	33	92	39	95	48
Garrettsville	55	—15	52	—10	68	4	84	16	80	25	93	32	89	41
Georgetown	62	4	68	4	74	10	89	27	91	33	101	44	96	56
Greenville	56	0	52	— 1	66	8	80	27	81	35	92	42	89	52
Hanging Rock	66	3	65	3	75	1	86	26	88	33	98	42	94	49
Hiram	54	— 5	52	—10	66	3	82	20	82	32	91	38	89	44
Jacksonborough	64	0	54	2	70	2	88	30	84	32	94	50	96	60

annual range of temperature, etc.—Continued.

August.		September.		October.		November.		December.		Annual range.	Authority.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
°	°	°	°	°	°	°	°	°	°	°	
90	48	75	32	61	27	68	11	54	— 9	112	G. Pomeroy Keese.
....	....	....	....	67	31	65	12	50	m15	....	U. S. post hospital.
81	44	76	32	64	30	66	10	54	2	....	W. P. Hunt.
91	40	76	32	62	24	61	10	53	3	111	F. P. Yates.
93	40	83	34	72	23	73	8	53	— 5	108	Jesse D. Rogers.
92	52	84	36	70	26	70	8	54	5	102	Mrs. N. S. Yates.
....	....	80	42	65	35	63	17	53	9	....	U. S. post hospital.
90	43	81	37	75	29	74	12	52	— 2	102	Chas. E. Whitney.
92	46	80	34	64	26	70	8	54	2	111	Engineering department, Cornell University.
....	....	81	32	72	27	76	10	53	0	....	Prof. F. M. Comstock.
90	49	80	37	69	31	71	10	....	....	....	Dr. M. A. Veeder.
89	42	80	32	69	22	69	2	52	—14	110	U. S. post hospital.
90	37	81	34	68	30	75	5	68	—10	....	F. X. Straub.
96	53	84	41	69	35	72	18	56	9	94	Signal Service.
94	53	80	40	66	33	72	17	55	9	96	Meteorological Observatory, Central Park.
90	49	82	40	69	36	71	18	53	10	94	U. S. post hospital.
90	53	80	38	65	29	68	11	....	....	....	J. M. Patrick.
87	50	78	36	70	30	69	9	51	— 3	99	Signal Service.
90	39	79	32	69	23	72	7	50	— 5	104	E. B. Bartlett.
92	52	84	37	71	50	72	10	51	7	....	L. D. Cummings.
91	40	82	25	56	26	66	3	52	— 8	114	U. S. post hospital.
87	46	81	35	72	29	73	11	56	6	103	Signal Service.
91	54	81	38	70	27	70	8	48	0	....	George Smart.
93	40	80	32	68	27	72	7	54	— 1	....	W. S. Collier, M. D.
90	54	79	45	66	33	67	21	58	10	92	S. B. Strong.
101	39	82	29	64	22	70	5	51	— 5	122	Thomas Birt.
....	....	80	38	69	30	71	23	54	8	....	U. S. post hospital.
94	47	81	32	65	28	67	7	58	4	111	Do.
84	57	84	32	65	29	68	11	56	8	105	Prof. O. R. Willis.
....	....	90	35	80	33	84	29	69	20	....	Prof. J. W. Gore.
100	55	88	38	78	37	78	30	68	20	84	Signal Service.
100	59	91	45	80	39	....	....	....	....	....	Do.
88	62	84	50	76	48	74	38	65	28	66	Do.
92	53	82	34	72	32	75	25	60	17	85	W. F. Ross, M. D.
102	58	97	39	79	43	80	34	72	24	85	Signal Service.
93	52	79	32	74	34	74	27	59	15	81	Dr. R. L. Beall.
100	50	89	35	80	34	....	....	....	....	....	Signal Service.
97	52	....	....	76	37	78	29	68	20	....	State weather service.
97	48	....	....	79	32	76	26	68	15	....	Do.
98	61	91	42	80	40	90	31	67	23	....	Signal Service.
96	53	88	39	77	33	79	30	68	18	86	Do.
100	60	90	45	80	38	83	32	68	21	81	T. C. Harris.
96	62	....	....	....	....	75	30	59	22	....	State weather service.
92	60	88	40	77	42	74	35	62	23	73	Signal Service.
94	55	82	34	74	35	76	28	60	17	82	W. A. Eliason.
100	54	....	....	....	....	....	....	....	....	....	E. V. Zoeller.
98	54	89	38	78	36	....	....	....	....	....	Signal Service.
103	48	95	34	79	29	....	....	....	....	....	Do.
101	50	94	36	77	33	80	30	66	17	88	T. A. Clark.
95	59	88	44	79	45	79	36	68	26	76	Signal Service.
89	45	80	37	72	29	71	19	57	10	95	State weather service.
90	47	78	32	72	29	75	20	62	8	....	Do.
94	44	80	30	76	26	70	17	55	6	102	Do.
94	53	84	40	74	29	74	22	58	10	....	Wm. Sheffield.
....	....	....	....	....	....	....	....	....	....	....	State weather service.
93	45	86	38	77	29	74	21	62	2	99	Do.
97	52	83	35	79	34	76	27	62	16	91	Signal Service.
93	48	79	32	74	31	72	24	59	14	98	State weather service.
94	48	82	38	75	31	74	24	57	14	97	Signal Service.
94	46	81	38	75	31	74	24	57	14	97	G. A. Hyde.
100	53	85	38	74	36	74	28	60	16	98	John W. Hammitt.
89	46	....	....	67	38	....	22	58	12	....	William Smeed.
96	47	82	32	76	31	73	24	58	13	95	Signal Service.
99	44	84	28	76	27	71	21	60	12	101	State weather service.
89	49	77	31	....	....	70	22	....	....	....	B. B. Ault.
97	46	84	38	74	30	74	21	59	16	....	Charles W. Goodspeed.
90	38	82	32	72	23	73	15	56	— 4	108	S. M. Luther.
98	48	86	32	77	30	76	24	60	12	97	State weather service.
92	45	81	34	75	28	70	22	55	12	93	Do.
95	49	84	32	79	28	75	20	61	8	97	Do.
....	....	81	34	70	31	70	18	54	6	....	Do.
96	50	84	38	76	33	70	22	52	14	96	Dr. J. B. Owsley.

Table of maximum and minimum temperature and

States and stations.	January.		February.		March.		April.		May.		June.		July.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Ohio—Continued.	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Jefferson	51	— 7	50	— 8	66	— 1	82	22	78	33	91	39	86	44
Logan	59	— 3	63	5	75	11	89	24	86	33	100	41	92	51
Lordstown	54	— 2	54	—10	66	8	84	20	......	......	99	34	86	46
McConnelsville	60	— 2	58	3	72	10	86	23	83	32	96	39	91	50
Marietta	......	......	......	......	75	6	88	26	86	35	95	42	91	53
Napoleon	40	— 2	51	— 4	69	7	85	29	86	36	96	41	90	48
New Alexandria	56	— 4	56	— 2	69	7	87	22	83	33	97	41	90	46
New Athens	54	— 2	54	— 2	67	8	85	23	83	35	92	42	86	50
New Comerstown	66	— 5	54	2	68	10	86	22	85	32	96	38	90	49
North Lewisburgh	57	— 1	57	— 1	70	8	87	28	86	33	98	42	96	53
Oberlin	54	— 9	52	— 3	66	6	82	25	81	30	92	39	88	48
Ohio State University	59	—11	58	4	70	10	85	23	81	34	98	38	91	49
Paulding	70	2	86	20	86	25	97	34	95	46	97	34	95	46
Pomeroy	60	1	66	7	77	10	92	27	91	34	102	40	96	52
Portsmouth	68	8	68	8	77	2	87	31	88	38	95	44	94	57
Quaker City	58	— 4	56	0	70	9	84	24	83	35	94	37	87	45
Sandusky	54	— 2	53	— 3	72	6	85	28	84	37	93	44	90	57
Savannah (Ruggles)	53	— 5	52	0	64	8	82	32	78	38	92	42	90	56
Sidney	55	—10	55	— 5	68	13	83	30	84	36	100	42	94	53
Tiffin	54	— 2	53	1	70	9	83	31	83	37	94	51	92	53
Toledo	46	— 4	52	— 6	69	4	83	26	81	31	95	42	89	49
Upper Sandusky	54	— 2	52	— 1	64	6	83	28	82	34	94	41	91	50
Wapakoneta	58	—15	52	— 4	......	......	......	......	86	32	101	44	97	53
Wauseon	44	—14	52	— 9	71	— 6	86	23	84	23	98	35	94	43
Waverly	64	4	61	5	72	0	......	......	......	......	......	......	......	......
Westerville	54	— 5	54	2	68	8	84	27	82	35	98	40	91	50
West Milton	57	— 1	62	1	70	10	90	30	86	39	99	50	102	55
Wooster	......	......	......	0	......	8	......	19	......	30	88	40	......	43
Yellow Springs	58	— 2	54	1	68	7	82	28	81	34	95	39	92	50
Youngstown	56	—10	58	— 8	68	3	87	20	82	28	94	34	92	42
Oregon:														
Albany	64	1	60	32	67	26	81	30	90	41	83	51	96	46
Ashland (1)	......	......	60	20	65	20	80	35	85	45	83	40	93	45
Ashland (2)	62	— 3	69	20	75	21	87	28	92	35	83	40	101	46
Astoria	60	10	54	32	64	28	66	36	77	46	75	50	88	48
Bandon	60	14	60	30	62	27	67	34	65	40	71	49	79	48
East Portland	56	— 4	56	30	62	20	84	30	92	32	84	52	95	50
Eola	65	— 5	56	31	62	26	77	40	85	45	75	53	89	52
Klamath, Fort (1)	46	—39	57	1	60	— 3	78	18	86	22	80	30	90	31
Klamath, Fort (2)	51	—34	61	1	66	— 3	82	16	91	21	84	29	93	41
La Grande	50	—34	56	20	64	6	81	29	87	33	81	43	94	43
Lake View	50	—24	......	......	......	......	82	26	87	26	82	34	......	......
Linkville	46	—24	62	13	65	7	80	24	87	26	82	35	k92	k38
McMinnville	......	......	60	24	65	22	79	29	89	35	82	42	93	39
Mt. Angel	......	......	......	......	......	......	......	......	......	......	......	......	96	43
Portland	62	— 2	61	30	68	24	84	32	91	38	87	48	97	46
Roseburgh	71	— 6	67	28	71	23	84	29	93	36	86	44	100	45
Siskiyou	......	......	56	18	72	16	88	31	88	38	81	44	95	46
Yaquina light-house	60	1	62	31	61	29	69	37	80	39	68	47	78	40
Pennsylvania:														
Altoona	58	·2	59	— 2	66	4	84	25	87	35	97	41	89	50
Beaver	......	......	......	......	......	......	......	......	......	......	......	......	89	53
Bernice	46	—11	49	—19	60	— 6	82	17	77	24	91	37	......	......
Bethlehem	52	— 4	55	— 4	61	5	88	12	86	32	95	43	90	50
Blooming Grove	49	—12	52	—22	59	— 2	89	24	86	36	98	48	98	54
Carlisle	40	1	50	0	68	6	88	29	86	40	99	52	96	54
Catawissa	50	— 6	53	— 9	66	3	90	26	84	31	99	40	92	49
Chambersburgh	44	— 1	51	0	64	— 5	......	......	86	30	100	41	94	47
Charlesville	53	— 8	58	0	67	1	84	20	86	28	94	34	97	44
Clarion	49	—14	51	—16	66	1	82	20	82	36	90	34	......	......
Coatesville	......	......	......	......	68	— 3	91	24	89	29	97	43	93	50
Corry	49	—15	55	—25	68	—10	84	18	82	26	98	32	89	37
Coudersport	......	......	......	......	......	......	84	15	86	24	94	30	86	38
Drifton	50	—10	52	—11	59	— 5	87	20	84	24	97	38	89	46
Dyberry	44	—19	47	—31	54	— 5	84	17	78	24	91	32	85	39
Eagle's Mere	40	—14	42	—16	51	— 6	78	16	76	29	86	39	80	44
Emporium	......	......	......	......	61	1	85	20	86	27	96	35	90	43
Erie	55	— 6	51	— 8	67	3	73	22	81	36	88	44	87	52
Franklin (1)	48	— 8	46	—18	62	2	80	24	82	36	90	42	86	51
Franklin (2)	......	......	......	......	......	......	......	......	81	36	92	42	86	51
Germantown	52	— 2	54	— 3	65	4	90	30	80	42	96	52	88	52
Girardville	47	— 4	50	— 4	59	1	85	25	82	31	92	50	89	......
Grampian Hills	52	—12	54	—14	62	0	84	16	84	28	94	38	86	45
Greenville	54	—14	52	—11	67	4	84	20	81	30	94	35	90	48
Harrisburg	......	......	......	......	......	......	......	......	......	......	......	......	91	54
Hollidaysburgh	49	— 5	58	— 9	78	2	89	20	86	27	98	35	93	44

annual range of temperature, etc.—**Continued.**

August.		September.		October.		November.		December.		Annual range.	Authority.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
°	°	°	°	°	°	°	°	°	°	°	
88	40	80	36	73	29	75	19	49	1	99	State weather service.
102	44	89	28	79	27	76	19	61	10	105	Do.
90	38	80	30	70	26	72	19	55	0	....	W. S. Dean.
96	44	83	30	74	26	76	20	56	7	98	State weather service.
93	47	81	34	74	30	77	23	61	12	....	Do.
95	45	83	36	75	29	75	24	58	12	100	Dr. T. C. Hunter.
92	42	79	34	71	27	72	20	57	7	101	State weather service.
90	48	77	35	70	30	69	20	62	9	94	T. M. Sewell.
97	46	84	31	79	22	72	20	52	7	102	Do.
99	47	87	34	80	29	76	19	56	8	100	H. D. Gowey.
98	45	90	36	72	29	72	21	55	13	107	State weather service.
96	42	82	26	78	25	72	19	58	9	109	Do.
98	35	....	....	....	....	....	....	....	....	....	Do.
101	46	84	31	....	....	75	24	61	11	101	Do.
94	50	82	35	79	32	80	26	62	14	93	Dr. D. B. Cotton.
91	44	....	....	....	....	....	....	58	3	....	State weather service.
95	49	87	39	76	33	76	25	61	15	98	Signal Service.
92	45	80	41	70	30	68	22	56	15	97	Peter Bowman.
96	46	85	32	78	29	71	22	57	13	110	State weather service.
95	45	84	41	72	31	71	24	57	13	97	Rev. T. H. Sonedecker.
94	44	86	37	76	29	74	24	62	13	101	Signal Service.
94	43	84	35	74	28	72	22	57	8	96	State weather service.
....	....	....	....	75	27	75	19	58	10	....	Do.
98	38	92	30	76	23	76	20	56	6	112	Thos. Mikesell.
....	....	....	....	....	....	....	....	....	....	....	State weather service.
95	44	80	80	76	30	71	22	56	10	103	Prof. Jno. Haywood.
103	47	89	36	75	30	74	24	59	12	104	Luke S. Motte.
....	41	....	31	....	27	....	21	57	9	....	Do.
83	42	80	34	74	26	70	20	58	9	97	C. W. Rice.
92	44	82	38	73	34	78	20	57	4	104	State weather service.
94	48	92	44	84	34	60	30	58	25	95	John Briggs.
98	55	97	50	75	42	60	23	65	30	....	Pacific Railway system.
98	46	102	40	84	31	72	24	65	26	105	Signal Service.
74	54	80	49	68	41	58	35	55	34	78	Do.
70	50	92	44	73	41	64	27	63	32	78	George Bennett.
92	56	88	44	74	38	57	30	55	28	99	Dr. George Wigg.
88	55	88	51	74	36	56	30	57	27	94	Thomas Pearce.
91	32	88	28	78	14	56	12	47	13	130	Signal Service.
97	32	83	38	83	13	69	11	53	11	131	U. S. post hospital.
....	....	....	....	....	....	....	....	....	....	....	Rev. J. K. Romig.
....	....	94	41	83	26	....	....	....	....	....	Signal Service.
....	....	91	34	78	25	54	18	48	18	....	Do.
93	45	89	36	77	31	60	26	56	22	....	Prof. W. J. Crawford.
94	48	93	42	77	35	58	29	58	22	....	Rev. F. B. Held.
92	52	90	44	82	37	58	31	59	31	99	Signal Service.
93	47	99	41	83	33	62	31	66	32	106	Do.
98	50	99	42	88	34	73	29	58	27	....	Pacific Railway system.
70	43	87	43	[1]72	[1]43	....	....	....	....	....	Dr. J. G. Jessup.
95	48	79	40	71	34	73	20	58	9	99	Charles B. Dudley.
91	49	81	35	73	31	....	....	....	....	....	State weather service.
90	37	75	30	61	27	....	....	....	....	....	Do.
95	45	79	40	64	29	73	14	55	10	99	Do.
97	49	....	....	....	....	....	....	....	....	....	John Grathwohl.
....	....	82	42	70	32	77	19	56	13	....	State weather service.
98	46	80	38	67	31	77	19	60	9	108	Robert M. Graham.
98	43	....	....	....	....	70	16	....	....	....	State weather service.
93	38	81	34	73	26	76	15	58	8	105	Do.
....	....	78	32	68	19	....	....	55	— 9	....	Clarion State Normal School.
96	43	84	34	71	26	76	16	60	9	....	State weather service.
90	33	84	30	74	24	74	12	52	—10	123	William Loveland.
89	34	79	31	68	21	73	10	....	....	....	State weather service.
94	43	77	35	65	28	73	11	57	0	108	H. D. Miller.
89	38	77	29	62	22	72	8	53	— 3	122	Theo. Day.
85	42	70	32	54	26	65	4	47	— 4	102	State weather service.
93	40	84	35	69	26	73	12	56	— 1	....	Do.
88	48	80	37	72	34	74	20	55	8	96	Signal Service.
86	40	76	32	66	26	70	10	46	— 4	108	Joseph Bell.
....	....	....	....	....	....	....	....	....	....	....	State weather service.
94	52	80	38	64	32	70	16	56	9	99	Thomas Meehan.
91	47	77	38	64	30	70	11	53	7	96	State weather service.
90	40	80	32	68	28	70	14	50	0	108	Nathan Moore.
90	38	82	32	71	20	74	16	56	— 4	108	State weather service.
95	51	81	36	69	35	74	19	54	11	....	Signal Service.
96	39	83	33	74	28	77	14	59	7	107	State weather service.

Table of monthly maximum and minimum temperature

States and stations.	January.		February.		March.		April.		May.		June.		July.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Pennsylvania—Con't'd.	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Honesdale	......	......	......	......	......	......	......	......	76	27	89	32	84	41
Huntingdon	47	— 8	58	—11	65	7	89	21	85	22	99	36	94	45
Indiana	58	— 6	61	— 4	68	3	84	20	85	27	94	35	89	43
Johnstown	......	......	......	......	......	......	89	21	90	30	96	38	92	48
Kutztown	......	......	......	......	60	2	90	27	87	38	94	52	......	......
Lancaster	47	— 5	51	— 2	64	2	88	24	86	32	97	41	93	57
Lebanon	41	— 4	48	— 2	68	8	89	26	86	30	96	40	91	48
Lock Haven	......	......	......	......	62	6	92	15	85	28	100	41	93	46
McConnellsburgh	47	2	58	3	68	0	87	23	86	30	97	40	91	47
Meadville	54	—10	52	— 8	66	3	85	23	80	33	......	......	......	......
Montrose	......	......	......	......	58	— 4	84	18	81	31	99	45	89	57
New Bloomfield	44	—10	54	— 8	64	6	89	23	85	29	98	38	92	45
New Castle	54	—12	53	— 6	69	6	86	20	85	27	95	33	90	41
Philadelphia	56	2	58	2	70	8	91	31	87	42	97	52	94	57
Philipsburgh	52	—10	53	—18	63	0	86	19	91	24	95	35	90	46
Pittsburgh	61	3	61	1	72	9	86	26	85	37	95	41	90	50
Pottstown	47	0	54	0	68	4	90	29	87	35	98	50	93	54
Quakertown	50	— 4	50	— 4	65	2	87	26	85	29	97	42	94	47
Reading	43	0	48	— 2	65	7	93	33	87	35	99	52	94	43
Rimersburgh	......	......	......	......	66	0	84	25	85	36	......	......	......	......
Salem Corners	......	......	......	......	......	......	......	......	69	42	86	47	73	55
Scranton	56	— 6	51	—17	63	0	88	23	83	30	96	38	......	......
Selin's Grove	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Shamokin	50	— 6	55	—10	64	5	87	21	85	26	82	36	90	45
Smethport	......	......	......	......	......	......	......	......	79	27	92	34	86	39
Somerset	56	—13	58	— 6	67	1	84	18	83	28	92	31	94	42
State College	47	— 9	56	—13	58	— 2	84	28	82	33	95	38	86	45
Stroudsburgh	......	......	......	......	63	3	89	23	84	28	94	36	90	44
Swarthmore	53	2	55	2	70	6	87	28	85	34	96	48	92	53
Tionesta	......	......	53	—19	68	5	85	18	83	29	93	35	......	......
Troy	......	......	51	—15	55	0	88	22	79	35	93	40	87	51
Uniontown	60	2	63	5	72	7	87	25	82	32	90	38	88	56
Washington	55	2	59	2	69	9	83	24	......	......	......	......	......	......
Wellsborough	50	—16	55	—17	56	— 2	84	24	80	30	94	35	90	40
West Chester	50	0	54	— 1	68	6	86	28	86	36	94	49	92	52
Westtown	48	— 3	51	4	66	8	......	......	89	35	87	48	92	52
Wysox	48	— 6	50	—18	65	2	84	23	81	28	94	36	90	41
York	43	3	54	6	69	— 2	92	22	88	32	98	43	94	45
Rhode Island:														
Block Island	55	— 3	49	1	52	15	60	27	71	35	83	49	81	53
Bristol	52	— 5	47	— 1	51	13	67	23	72	34	86	48	84	52
Narragansett Pier	55	— 5	50	— 1	58	10	65	22	78	32	89	46	88	48
Newport	52	— 5	48	0	56	12	64	25	75	31	80	49	84	54
Olneyville	57	— 8	60	0	55	11	79	23	88	30	101	46	90	50
Providence (1)	56	—11	54	— 4	54	10	75	22	88	32	98	42	......	......
Providence (1)	56	— 5	54	0	54	12	......	......	......	......	......	......	......	......
Woonsocket	56	—14	51	— 3	52	10	76	20	81	30	99	46	88	52
South Carolina:														
Abbeville	72	18	67	19	76	24	87	38	91	43	98	56	100	62
Aiken	74	22	70	22	75	26	85	43	87	45	95	59	96	63
Allendale	......	......	......	......	......	......	87	44	90	55	95	56	100	60
Batesburgh	......	......	......	......	......	......	91	40	96	43	100	58	101	62
Belfast	74	24	72	24	79	29	......	......	......	......	......	......	......	......
Black's	......	......	75	35	80	37	90	38	90	39	96	52	......	......
Blackville	......	......	......	......	......	......	95	37	95	45	97	55	100	59
Branchville	......	......	......	......	......	......	89	40	95	47	97	51	101	57
Brewer Mine	75	15	72	17	78	20	94	38	93	41	99	54	107	60
Camden	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Cedar Springs	72	17	77	15	80	20	91	31	93	33	97	58	99	59
Charleston	76	26	72	28	74	30	88	50	87	52	95	62	100	68
Cheraw	75	15	71	24	75	20	91	37	95	43	102	53	104	59
Chester	......	......	......	......	......	......	90	39	95	40	95	55	108	65
Clinton	......	......	60	32	74	27	92	44	92	50	101	63	104	64
Columbia	75	21	70	22	77	24	90	41	94	45	96	58	101	63
Conway	......	......	73	27	78	31	89	50	89	55	93	63	......	......
Evergreen	71	16	70	17	74	21	86	39	86	40	94	54	100	63
Florence	74	19	......	......	......	......	91	39	94	45	99	56	104	58
Georges	......	......	......	......	......	......	90	37	93	46	99	52	102	56
Greenville	......	......	......	......	78	28	90	36	90	41	98	51	102	57
Greenwood	74	18	......	......	......	......	86	41	92	45	98	59	100	63
Hardeeville	75	22	75	28	80	28	91	40	94	49	98	51	102	62
Jacksonborough	......	......	......	......	......	......	91	38	94	48	96	52	102	53
Kingstree	......	......	......	......	......	......	90	41	94	49	98	53	[a]103	[a]57

and annual range of temperature, etc.—Continued.

August.		September.		October.		November.		December.		Annual range.	Authority.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
°	°	°	°	°	°	°	°	°	°	°	
86	39	75	30	60	23	68	9	53	− 2	....	State weather service.
96	42	84	34	71	29	77	12	....	....	....	Do.
91	40	82	32	72	26	73	16	60	9	100	Do.
96	45	83	37	....	....	....	....	....	....	....	Do.
95	42	83	36	60	28	....	....	....	....	....	Do.
....	....	84	32	68	30	75	17	59	9	....	Do.
96	43	81	34	69	30	74	17	58	10	100	Do.
100	44	78	34	66	25	69	14	55	5	....	Do.
95	42	84	37	74	28	74	18	60	11	95	Do.
....	....	....	....	....	....	79	22	61	7	....	Prof. J. H. Montgomery.
95	44	82	34	....	....	....	....	....	....	....	State weather service.
98	42	84	33	70	29	64	14	58	9	108	Do.
93	40	83	32	73	25	75	17	57	2	107	Do.
98	54	82	40	70	35	75	18	61	12	96	Signal Service.
93	33	79	34	71	27	74	10	55	0	113	G. F. Dunkle.
93	48	81	39	74	33	74	24	62	12	94	Signal Service.
97	50	81	40	64	28	73	18	58	11	98	State weather service.
95	42	81	34	64	26	73	11	56	7	101	J. L. Heacock.
97	39	82	34	68	27	74	14	58	8	101	C. M. Dechant.
92	46	....	....	69	30	68	15	....	....	....	Do.
77	52	66	38	54	32	61	19	52	− 2	....	T. B. Orchard, M. D.
....	....	78	34	62	31	70	13	55	4	....	State weather service.
97	50	78	32	69	32	73	16	52	9	....	Do.
97	43	78	35	66	26	75	25	....	....	....	Do.
89	38	80	32	72	30	74	10	56	4	....	Do.
92	33	78	30	71	26	72	15	57	− 2	107	Do.
92	43	77	32	67	29	72	12	57	1	108	Agricultural Experiment Station.
....	....	....	....	....	....	....	....	....	....	....	State weather service.
94	48	81	37	66	30	74	18	58	11	94	Do.
90	42	83	32	71	31	....	....	56	− 2	....	Do.
95	45	77	37	62	30	70	10	55	4	....	M. Gustin.
94	43	80	38	71	29	76	22	62	6	92	State weather service.
....	....	....	....	....	....	....	....	....	....	....	Do.
92	34	76	32	66	24	76	6	58	− 4	111	Hiram D. Deming.
94	49	81	36	67	31	72	16	56	9	95	State weather service.
93	48	83	36	....	....	....	....	60	8	....	William F. Wickersham.
92	41	78	33	62	25	62	10	56	6	112	State weather service.
98	47	83	35	70	30	76	20	60	12	100	Do.
81	55	75	44	62	34	64	21	54	10	86	Signal Service.
84	54	76	34	63	33	61	14	54	8	91	New England Meteorological Society.
85	47	80	32	65	28	63	14	53	8	94	Signal Service.
83	56	78	39	64	34	60	18	52	8	89	New England Meteorological Society.
92	44	84	33	70	32	80	12	68	8	109	Do.
....	....	81	28	70	29	72	10	59	6	....	Do.
92	51	79	34	65	34	68	14	59	8	....	Do.
91	50	78	28	64	27	66	11	58	7	113	Do.
100	63	85	40	77	40	75	30	....	....	....	State weather service.
94	60	84	44	78	44	78	32	71	21	74	Dr. W. H. Geddings.
98	57	90	41	84	41	....	....	....	....	....	Signal Service.
100	55	90	39	80	40	....	....	....	....	....	Do.
....	....	....	....	....	....	....	....	....	....	....	State weather service.
....	....	....	....	....	....	....	....	....	....	....	Do.
97	54	88	38	80	39	....	....	....	....	....	Signal Service.
97	54	90	45	88	40	....	....	67	21	....	Do.
102	57	91	52	80	39	80	30	67	21	92	State weather service.
90	55	79	36	67	39	70	25	59	18	....	Do.
101	50	85	31	83	31	80	22	70	18	88	J. F. Bayerly.
96	67	89	50	81	50	80	36	68	28	74	Signal Service.
100	53	90	35	83	32	80	31	69	22	89	Do.
100	54	90	37	80	38	....	....	....	....	....	Do.
102	65	85	46	78	42	77	37	65	23	....	State weather service.
99	58	88	42	82	42	80	31	70	24	80	Signal Service.
....	....	....	....	....	....	....	....	....	....	....	State weather service.
96	....	....	....	....	....	....	....	62	16	....	Do.
100	56	91	39	82	39	80	39	68	29	....	Signal Service.
100	54	92	38	82	37	....	....	....	....	....	State weather service.
101	51	87	32	79	35	....	....	....	....	....	Signal Service.
102	59	92	42	77	33	....	....	....	....	....	Do.
100	50	93	43	85	40	81	29	70	23	80	Do.
98	54	92	42	81	39	....	....	....	....	....	Do.
99	54	93	52	86	39	....	....	....	....	....	Do.

Table of maximum and minimum temperature and

States and stations.	January.		February.		March.		April.		May.		June.		July.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
South Carolina—Cont'd.	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Kirkwood	61	16	60	21	66	22	79	43	81	48	86	61	88	66
Marion	74	22	63	31	76	26	75	48	91	50	95	55		
Newberry	70	21	64	22	74	26	84	44	89	50	93	56	99	63
Orangeburgh					78	40	89	50	96	65	96	65		
St. George's							90	37	93	46	99	52	102	56
St. Matthew's							90	39	92	46	97	56	100	61
Spartanburgh					75	22	82	38	90	38			99	60
Statesburgh	73	22	72	22	76	25	87	42	88	46	94	56	97	65
Timmonsville									89	59	93	65	95	71
Trial									84	51	87	61	98	65
Williamstown					72	23	84	40	85	44	93	58	97	66
Windsor													101	78
Winnsborough	72	16	70	18	77	19	90	37	96	40	95	55	98	60
Yorkville											95	59	98	61
Tennessee:														
Andersonville	62	7	66	7	74	15	85	33	88	33	95	47	93	58
Arlington							87	36	92	42	94	46	102	60
Ashwood	70	12	65	13	75	25	82	38	86	41	91	47	95	65
Austin	72	9	68	11	77	21	86	34	88	44	98	46	97	68
Beech Grove	65	10	71	12			84	40	87	45	90	61	93	66
Boliver	70	10					86	42	89	42	90	47	98	56
Brownsville							90	31	92	43	97	48	100	60
Chattanooga	73	13	68	10	80	22	84	40	88	40	94	52	96	66
Cookeville	70	7	68	5	76	28								
Covington	70	7	66	20	76	28	82	42	87	[d]50	88	56	94	68
Dyersburgh							87	37	94	41	100	48	103	60
Fayetteville	70	9	64	10	76	21	84	40	89	41	95	54	96	67
Florence Station	69	13	65	13	75	24	84	46	85	48	93	57	91	69
Fostoria	64	10	64	10	75	13	82	30	82	30	90	47	85	58
Grand Junction							85	39	89	45	93	50	97	61
Greenville	68	12	61	4	76	13	81	32	82	34	91	54	89	61
Hohenwald	74	6	70	10	78	18	86	30	87	35	93	36	102	54
Jacksborough														
Jonesborough			[e]66	[e]6	74	12	84	38						
Kingston Springs			68	10	75	21	85	34	88	34	93	42	95	56
Knoxville	70	12	67	9	76	19	85	36	87	36	95	50	93	60
Lawrenceburgh	70	7	65	10	74	17	83	30	88	32	97	39	95	65
Leeville														
Lewisburgh			71	18							90	54	93	67
McKenzie														
Maryville			63	11	72	20	83	40	86	44	93	56	93	67
Memphis	74	6	71	21	80	28	86	43	88	46	94	54	97	66
Milan (1)							87	35	93	42	97	46	100	59
Milan (2)	73	5	70	14	79	23	87	36	89	42	92	47	97	64
Nashville	73	2	67	11	78	23	85	38	88	37	96	48	97	62
Newport					79	14	88	30	89	35	96	54		
Nunnelly	71	8	66	12	75	20	85	33	85	35	92	43	94	57
Parksville	68	14	64	12	77	19	86	35	89	38	91	50		
Riddleton	70	10	65	8	76	21	85	33	87	45	94	45	92	60
Rogersville	62	10	69	5	71	14	79	32	85	32	95	48	93	62
Savannah									84	38	86	48	96	60
Springdale														
Trenton	72	4	68	15	76	24	86	35	86	41	87	46	93	58
Watkins			68	11	78	27	87	38	90	38	100	48	100	68
Waynesborough	72	8	65	12	73	20	84	33	88	38	96	38	97	55
Texas:														
Abilene	75	— 5	77	21	87	23	92	42	95	50	99	60	96	66
Austin	78	6	80	37	78	36	89	55	92	58	95	65	98	66
Belton							87	45	89	46	95	58	97	62
Brady														
Brenham							87	50	93	51	100	64	98	68
Brownsville	78	21	84	46	85	45	84	61	88	64	92	67	94	72
Cedar Hill	84	3	74	32	90	29	94	50	89	55	99	72	101	73
Clark, Fort														
Cleburne	74	— 2	70	29	81	24	89	38	86	48	89	62	92	61
Colorado					88	24	[c]92	[c]43	94	50	104	51	100	68
Columbia							85	51	90	50	96	61	95	66
Comanche	76	— 4	70	26	80	26	94	42	92	52	97	64	101	63
Concho, Fort	79	1	79	28	91	24	85	43	98	51	104	58	102	67
Corpus Christi	73	16	72	43	82	41	79	57	86	44	89	66	90	73
Corsicana (1)							88	42	92	49	[c]96	61	98	68
Corsicana (2)														
Cuero											96	78	97	80
Dallas							93	45	91	51	98	61	101	65
Davis, Fort (1)	72	0	69	28	78	26	84	36	87	45	96	56	91	60
Davis, Fort (2)														

annual range of temperature, etc.—Continued.

August.		September.		October.		November.		December.		Annual range.	Authority.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
°	°	°	°	°	°	°	°	°	°	°	
90	55	79	36	67	39	70	25	59	18	74	Colin Macrae.
96	54	88	40	82	42	....	....	....	....	....	State weather service.
99	58	84	40	77	41	78	29	69	21	78	Do.
....	....	....	....	....	....	....	....	....	....	....	Do.
100	54	92	38	85	37	....	....	....	....	....	Signal Service.
100	61	89	44	85	40	....	....	....	....	....	Do.
100	52	84	34	77	35	76	29	....	....	....	State weather service.
93	59	88	42	79	42	76	32	67	25	75	Dr. W. W. Anderson.
95	....	88	59	76	43	76	42	66	35	....	State weather service.
87	60	90	39	....	....	....	....	....	....	....	Do.
95	61	....	....	....	....	....	....	....	....	....	State weather service.
95	56	86	38	....	....	....	....	....	....	....	Do.
97	60	92	36	79	36	79	25	66	17	82	Do.
98	54	....	....	84	36	79	28	68	19	....	Do.
95	54	80	32	78	34	75	24	60	19	88	Do.
101	57	92	43	81	31	....	....	....	....	....	Signal service.
96	62	84	38	78	38	77	26	62	19	84	Rev. C. F. Williams.
100	62	86	40	80	36	78	24	69	14	91	P. B. Calhoun.
....	....	86	38	....	....	....	....	....	....	....	State weather service.
98	58	89	42	80	41	....	....	....	....	....	Signal service.
[a]103	57	89	42	81	38	....	....	....	....	....	Do.
98	58	87	38	82	37	78	27	65	20	88	Do.
....	....	86	38	....	....	....	....	....	....	....	State weather service.
96	67	[a]84	[a]50	80	40	76	31	64	20	89	Do.
108	58	89	37	81	34	....	....	....	....	....	Signal service.
97	60	90	36	78	34	76	26	62	18	88	State weather service.
94	63	82	40	78	40	73	28	63	24	81	Do.
92	60	82	30	76	33	73	24	64	9	82	Do.
99	59	87	44	81	41	....	....	....	....	....	Signal service.
93	56	82	35	77	34	74	26	59	18	89	State weather service.
104	53	88	32	82	30	80	19	66	10	98	Do.
92	50	82	33	77	30	72	25	....	....	....	Do.
....	....	....	....	....	....	....	....	55	16	....	Do.
96	55	87	34	80	34	78	24	66	15	....	Do.
96	53	85	35	78	36	77	26	60	22	87	Signal service.
....	....	87	30	77	29	77	19	62	10	....	State weather service.
....	....	....	....	[i]79	[i]35	78	27	67	13	....	Do.
95	64	84	42	70	38	....	....	64	15	....	Do.
....	....	88	44	84	40	80	28	66	20	....	Do.
95	62	....	....	....	....	....	....	....	....	....	Do.
99	60	88	50	83	40	78	31	66	23	93	Signal service.
102	57	89	37	81	34	....	....	....	....	....	Do.
99	58	88	36	81	34	79	26	66	17	94	M. D. L. Jordan, M. D.
98	58	86	38	81	36	76	26	66	17	96	Signal Service.
....	....	....	....	....	....	....	....	....	....	....	State weather service.
96	55	86	32	80	31	76	22	67	13	88	Do.
97	58	88	36	75	35	76	26	61	20	....	Do.
96	56	85	37	79	33	75	23	69	14	88	F. K. Fergusson.
96	63	82	37	75	32	71	26	65	16	91	Signal Service.
....	....	84	48	....	....	80	26	70	18	....	State weather service.
....	....	88	38	80	32	80	22	63	15	....	Do.
94	58	86	40	79	34	76	28	64	17	90	Do.
102	69	88	38	81	37	75	26	67	17	....	Do.
98	58	86	36	82	32	86	23	62	10	90	Do.
103	62	94	52	92	40	85	28	68	31	108	Signal Service.
99	66	92	62	87	42	84	35	72	34	93	Oscar Samostz.
100	61	93	53	88	43	83	31	74	28	....	Signal Service.
....	....	....	....	85	37	81	24	73	25	....	W. H. Potter.
99	68	94	58	90	48	87	39	74	36	....	Signal Service.
97	73	94	65	88	52	88	44	78	41	76	Do.
101	65	91	59	85	40	80	36	67	27	98	J. P. Berry.
....	....	....	....	85	46	88	19	75	19	....	U. S. post hospital
95	64	87	52	83	33	....	....	70	30	....	P. J. Norwood.
107	62	98	55	[f]90	[f]36	86	25	....	....	....	F. R. Blount.
97	70	90	59	88	51	86	32	75	32	....	Signal Service.
105	65	....	....	....	....	....	....	....	....	....	E. A. Wiesendanger.
111	61	96	53	93	45	90	28	75	29	110	U. S. post hospital.
92	71	91	63	85	50	83	39	81	37	76	Signal Service.
100	68	93	55	90	85	....	....	....	....	....	Do.
....	....	....	....	90	35	86	32	73	29	....	W. H. Hamilton.
100	65	94	63	92	45	....	....	....	....	....	Signal Service.
102	66	92	56	87	38	....	....	....	....	....	Do.
97	55	85	46	85	36	80	24	68	26	97	Do.
....	....	....	....	83	37	79	27	66	26	....	U. S. post hospital.

Table of maximum and minimum temperature and

States and stations.	January.		February.		March.		April.		May.		June.		July.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Texas—Continued.	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Decatur	78	— 2	75	24	86	26	92	40	87	51	93	60	98	68
Elliott, Fort (1)	77	—14	78	9	87	9	89	37	94	40	100	53	101	60
Elliott, Fort (2)	......	......	......	......	......	......	......	......	......	......	......	......	......	......
El Paso	75	18	74	29	84	28	87	44	93	47	104	60	101	63
Gallinas	......	......	......	......	......	......	86	49	93	56	95	65	99	57
Galveston	68	23	72	40	75	42	78	56	86	62	90	69	91	74
Granbury	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Hearne	......	......	......	......	......	......	85	45	90	47	94	59	96	61
Houston	......	......	......	......	......	......	87	51	91	58	96	61	98	65
Huntsville	......	......	......	......	......	......	88	52	92	48	95	62	98	65
Lampasas	......	......	......	......	......	......	88	43	99	43	94	43	97	59
Longview	......	......	......	......	......	......	88	43	93	47	100	61	100	63
Luling	......	......	......	......	......	......	86	49	95	52	98	61	100	64
McIntosh, Fort	83	15	80	44	82	41	91	56	102	59	101	63	103	70
Mesquite	76	4	71	30	84	27	94	39	93	50	98	61	103	64
Mexia	......	......	......	......	......	......	......	......	87	58	92	64	95	70
New Ulm	70	12	65	42	80	34	87	50	89	53	84	71	94	67
Orange	......	......	......	......	......	......	81	54	87	50	95	64	94	67
Palestine	78	4	75	33	79	29	84	42	88	49	94	64	94	64
Paris	......	......	......	......	......	......	91	48	88	47	97	61	101	62
Ringgold, Fort	89	18	88	40	91	37	97	55	105	60	102	62	104	69
Rio Grande City	86	21	85	43	89	41	92	59	100	63	97	66	99	71
San Antonio	77	11	78	38	79	37	86	50	91	54	94	61	95	64
Silver Falls	75	— 8	79	23	87	22	90	38	92	44	......	......	101	64
Tyler	......	......	......	......	......	......	89	40	93	44	103	60	97	61
Waco	......	......	......	......	80	30	88	40	92	50	97	61	99	65
Weatherford	......	......	......	......	......	......	91	45	92	42	100	56	98	59
Utah:														
Blue Creek	48	—22	......	......	58	19	......	......	......	......	......	......	105	66
Brock's	......	......	......	......	[1]71	[1]10	88	27	88	33	95	37	103	48
Corinne	55	—25	54	17	68	10	82	40	88	47	91	51	101	64
Fort Du Chesne	42	—38	49	— 5	69	10	83	19	85	23	95	32	102	41
Kelton	54	—30	56	10	72	8	84	38	86	46	95	46	98	64
Lake Park	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Ogden	50	—25	63	20	75	21	84	33	90	40	102	45	108	60
Promontory	47	—36	......	......	68	4	......	......	......	......	82	28	92	48
Salt Lake City	53	—17	59	24	68	19	80	31	84	38	93	45	98	52
Terrace	50	—30	70	20	76	32	90	44	......	......	94	57	98	70
Vermont:														
Brattleborough (1)	39	—20	45	—17	52	0	86	13	85	30	99	41	89	46
Brattleborough (2)	40	—17	47	—13	50	3	86	17	80	29	94	41	87	50
Burlington	42	—18	42	—16	58	1	80	16	81	31	98	46	88	49
Chelsea	36	—16	47	—15	50	— 2	62	8	74	33	81	40	78	44
Coventry	......	......	......	......	......	......	......	......	......	......	......	......	......	......
East Berkshire	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Guilford Center	40	—13	46	—14	53	6	78	20	76	35	......	......	......	......
Jacksonville	44	—24	57	—18	59	—12	75	4	81	24	92	37	87	42
Lunenburgh	38	—25	44	—22	50	—10	72	0	78	25	88	35	84	42
Manchester	43	—18	45	—16	54	— 7	82	17	78	37	90	47	84	54
Marlborough	36	—19	46	—15	51	— 3	75	16	......	......	......	......	......	......
Middlebury	......	......	......	......	53	2	78	18	77	34	89	50	82	52
Newport	40	—26	38	—28	50	— 8	77	6	[1]80	[1]36	90	50	90	54
Northfield	41	—24	46	—23	48	—10	77	8	77	24	89	35	85	41
St. Johnsbury	......	......	......	......	54	—11	75	2	78	23	88	30	89	48
Strafford	36	—18	44	—16	48	0	72	16	76	32	90	52	84	52
Vernon	36	—26	46	—25	50	— 4	80	16	80	34	98	48	90	54
Woodstock	44	—38	51	—30	55	—13	......	......	......	......	......	......	......	......
Virginia:														
Bird's Nest	70	15	66	17	75	13	87	36	90	48	94	56	93	64
Cape Henry	72	16	67	19	71	20	92	35	92	43	96	55	98	57
Christiansburgh	66	8	62	3	74	11	......	......	......	......	94	46	92	51
Dale Enterprise	67	6	63	8	76	10	89	26	90	38	97	44	96	50
Lynchburgh	74	14	66	11	80	16	89	31	90	41	96	50	95	55
Marion	60	8	60	1	68	10	82	27	90	30	90	40	91	51
Monroe, Fort	65	11	68	11	76	14	88	36	90	47	94	57	91	59
Norfolk	73	16	69	17	77	14	93	32	90	44	96	56	94	58
Petersburgh	68	14	67	15	66	19	88	33	88	42	93	51	93	52
Rappahannock	45	— 5	68	16	68	15	78	30	89	34	[1]99	[1]49	90	49
Snowville	......	......	63	5	68	12	79	27	82	33	90	48	92	55
Spottsville	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Summit	68	2	62	8	74	9	87	28	90	32	98	44	92	51

annual range of temperature, etc.—Continued.

August.		September.		October.		November.		December.		Annual range.	Authority.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
°	°	°	°	°	°	°	°	°	°	°	
101	62	90	52	86	38	84	32	73	25	103	H. D. Donald.
104	57	93	45	88	34	84	22	72	19	118	Signal Service.
....	....	....	....	89	34	85	21	72	18	....	U. S. post hospital.
102	59	94	51	91	38	79	25	70	29	91	Signal Service.
102	64	96	52	90	38	89	31	76	26	....	Lum Woodruff.
94	71	87	65	85	54	82	42	71	40	71	Signal Service.
102	69	91	60	88	41	85	31	77	25	....	E. H. Snider.
99	68	92	52	88	38	[a].........	....	....	....	....	Signal Service.
97	69	91	55	89	51	86	34	72	83	....	Do.
101	66	97	57	92	47	89	33	74	30	....	Do.
100	64	95	54	90	32	84	22	77	27	....	Dr. C. M. Ramsdell.
101	70	93	51	90	39	85	31	73	26	....	Signal Service.
101	67	[a]99	[a]56	90	41	....	....	76	30	....	Do.
104	70	94	57	91	49	86	36	[n]81	30	89	U. S. post hospital.
106	65	94	52	90	31	86	30	73	26	102	Silas G. Lackey.
96	65	90	58	87	45	83	32	70	29	....	Charles F. Mercer.
87	74	92	60	90	46	87	36	75	34	82	C. Runge.
[a]96	[a]71	[a]91	[a]56	88	48	....	....	....	....	....	Signal Service.
95	65	90	52	90	37	87	32	72	29	91	Do.
103	64	91	51	89	35	....	....	....	....	....	Do.
108	68	97	56	96	49	92	30	87	30	90	U. S. post hospital.
104	72	98	59	94	53	90	37	84	33	83	Signal Service.
99	69	92	58	88	40	86	34	75	35	88	Do.
106	58	99	46	90	35	84	26	71	25	....	C. M. Tilford.
97	65	90	51	89	36	85	31	72	27	....	Signal Service.
101	71	93	55	87	37	84	21	74	32	....	Do.
103	59	90	43	89	35	....	....	....	....	....	Do.
....	....	....	....	84	35	....	....	47	8	....	Pacific Railway system.
99	48	94	42	82	27	57	14	50	1	....	Signal Service.
101	61	92	52	74	37	58	24	51	4	126	Pacific Railway system.
95	44	91	36	80	17	58	10	47	—10	140	Signal Service.
100	59	97	49	78	34	66	18	50	— 3	130	Pacific Railway system.
91	50	92	46	62	36	59	28	49	11	....	E. Olson and F. Blumel.
96	62	90	58	78	28	60	23	46	4	133	Pacific Railway system.
96	58	92	48	72	38	50	22	42	0	....	Do.
98	54	92	48	78	32	63	26	57	9	115	Signal Service.
102	70	94	64	....	....	69	35	55	10	....	Pacific Railway system.
93	40	79	26	67	25	72	4	54	1	119	W. H. Childs.
89	45	75	29	66	28	74	8	54	4	111	New England Meteorological Society.
89	53	79	35	60	28	68	2	52	— 7	111	W. B. Gates.
77	46	69	30	54	24	64	— 1	48	—10	97	New England Meteorological Society
....	....	80	24	56	22	66	— 4	50	— 4	....	W. H. Tibbetts.
....	....	68	27	55	27	67	— 3	53	—19	....	J. H. Mears.
....	....	....	....	....	....	....	....	....	....	....	New England Meteorological Society.
89	38	80	22	65	23	72	1	56	— 4	116	Do.
85	48	78	25	62	20	58	0	52	—10	113	Dr. H. A. Cutting.
86	52	76	34	62	28	70	4	54	— 4	108	Rev. E. P. Wild.
....	....	....	....	....	....	....	....	....	....	....	New England Meteorological Soety.
84	52	76	36	60	29	64	1	50	— 6	....	S. Holton.
[j]88	[j]52	[j]72	[j]42	58	29	[n]68	[m]3	....	....	....	M. B. Trasher.
85	41	75	25	62	22	70	— 1	52	— 8	113	Signal Service.
80	44	72	27	58	23	64	0	50	—10	....	Franklin Fairbanks.
84	50	76	34	56	26	66	0	50	—10	108	H. F. J. Scribner.
90	50	80	32	64	26	72	4	52	0	124	New England Meteorological Society.
....	....	....	....	....	....	....	....	....	....	....	Do.
94	57	86	46	76	34	78	30	67	17	79	C. R. Moore.
99	57	91	49	76	43	80	34	66	20	83	Signal Service.
96	44	78	32	70	29	65	22	58	14	....	Do.
98	47	85	81	75	28	78	21	68	13	92	L. J. Heatwole.
98	53	84	85	78	33	76	26	63	17	87	Signal Service.
94	45	80	28	73	30	72	20	56	10	93	A. T. Lincoln.
96	....	89	40	79	39	79	30	61	19	85	U. S. post hospetal.
98	56	88	40	76	41	80	33	66	20	84	Signal Service.
97	65	[o]90	[o]38	74	35	73	30	62	19	83	Prof. Jas. M. Colson.
97	59	....	....	....	....	....	....	....	....	....	W. H. Ireland.
98	46	78	87	70	80	70	20	53	12	....	Mrs. Elmira D. Slenker.
....	....	....	....	75	82	75	31	68	16	....	B. W. Jones.
95	45	80	82	72	26	72	22	59	10	96	J. R. Sim.

Table of maximum and minimum temperature and

States and stations.	January.		February.		March.		April.		May.		June.		July.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Virginia—Continued.	°	°	°	°	°	°	°	°	°	°	°	°	°	°
University of Virginia	60	20	54	24	63	24	72	34	78	50	81	60	82	64
Variety Mills	70	12	62	10	76	16	86	26	88	37	98	43	[d]95	[d]50
Wyethville	63	9	60	4	66	12	81	26	84	32	88	42	89	49
Washington Territory:														
Blakeley	56	3	56	19	60	21	72	32	83	37	78	43	87	45
Canby, Fort	55	11	56	35	57	32	64	40	78	43	72	50	83	52
Neah Bay	58	14	60	30	59	24	63	31	75	34	72	40	72	39
Olympia	56	−2	59	29	65	23	79	31	88	34	82	42	92	40
Port Angeles	54	6	52	29	53	23	61	30	74	33	68	38	77	41
Pysht	51	8	......	......	59	22	62	31	71	34	75	42	75	40
Seattle	57	8	52	35	58	40	69	46	87	45	80	58	89	57
Spokane Falls	52	−30	58	22	62	12	80	27	92	35	85	44	96	42
Spokane, Fort	53	−31	61	22	66	15	83	26	97	39	87	42	102	41
Tacoma	57	0	53	31	59	25	68	39	83	46	75	52	82	55
Tatoosh Island	55	14	51	35	51	31	60	34	72	42	63	47	69	49
Townsend, Fort	58	7	58	29	59	26	64	36	81	40	76	45	78	48
Vancouver, Fort	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Vashon Island	54	5	62	30	62	23	80	30	90	42	84	49	90	42
Walla Walla	65	−17	65	31	71	12	85	36	95	41	89	47	102	48
Walla Walla, Fort	63	−19	64	27	71	7	88	33	97	38	96	49	104	48
West Virginia:														
Clarksburgh	62	1	60	4	69	0	81	22	84	31	99	37	91	48
Hartmonsville	......	......	......	......	63	0	79	24	86	34	86	50	84	50
Helvetia	62	−8	60	3	70	10	82	22	86	32	92	37	86	43
Middlebrook	54	−9	50	−6	60	0	75	20	77	28	84	44	80	46
Parkersburgh (1)	......	......	......	......	......	......	......	......	......	......	......	......	92	52
Parkersburgh (2)	64	2	56	8	74	−4	86	28	85	36	93	41	90	53
Rockport	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Tyler Creek	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Wisconsin:														
Beloit	36	−28	44	−23	54	−2	82	27	78	32	90	40	92	53
Delavan	38	−28	42	−24	57	−1	87	23	84	25	94	35	88	54
Deuster	[a]33	[a]−47	[c]48	−29	48	−10	81	16	82	25	96	32	98	47
Embarrass	33	−36	41	−34	42	−7	82	22	80	28	94	40	90	53
Fond du Lac	34	−44	39	−29	49	−3	83	22	80	28	90	56	92	48
Fredonia	33	−31	50	−26	50	−4	83	28	80	31	92	45	96	55
Green Bay	36	−36	43	−27	44	−8	82	21	78	28	92	38	90	52
La Crosse	34	−42	48	−28	49	−10	74	26	79	32	90	44	91	57
Lancaster	35	−24	47	−32	49	−10	80	24	82	29	92	34	96	48
Madison	40	−29	42	−25	45	−5	78	27	78	32	89	41	89	53
Manitowoc	38	−31	58	−28	45	−5	72	22	76	24	87	34	90	48
Milwaukee	37	−23	45	−21	60	−2	78	28	71	29	87	40	91	52
Prairie du Chien	35	−32	51	−21	53	−7	79	31	81	35	92	48	......	......
Waucousta	......	......	......	−28	......	−8	......	22	......	22	......	......	......	44
Wyoming:														
Bridger, Fort (1)	50	−42	51	2	57	−2	72	26	76	27	84	34	89	38
Bridger, Fort (2)	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Cheyenne	64	−27	56	8	64	−5	76	25	78	27	93	37	97	45
D. A. Russell, Fort	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Laramie, Fort (1)	68	−38	64	9	71	−10	84	22	84	27	[b]100	[b]41	103	[b]49
Laramie, Fort (2)	68	−34	63	8	70	−8	85	24	87	33	108	41	109	49
McKinney, Fort (1)	60	−36	58	2	63	−17	77	23	72	29	90	33	95	48
McKinney, Fort (2)	58	−33	55	−4	61	−15	75	24	76	30	87	33	93	46
Mammoth Hot Springs	49	−41	47	5	51	−13	75	20	76	27	83	37	95	38
Pilot Butte, Camp	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Sheridan, Camp	49	−41	47	−5	51	−13	72	22	76	27	83	37	95	38
Washakie, Fort (1)	49	−42	55	2	62	−8	76	26	80	25	91	36	99	43
Washakie, Fort (2)	50	−46	59	2	67	−7	80	22	77	29	91	37	99	43

annual range of temperature, etc.—Continued.

August.		September.		October.		November.		December.		Annual range.	Authority.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
°		°	°	°	°	°	°	°	°	°	
95	45	....	....	....	....	....	....	....	....	....	James Wearmouth.
98	50	....	....	....	....	....	....	....	....	....	J. Howard Micklem.
92	58	74	41	68	32	71	22	55	16	88	Howard Shriver.
88	46	80	43	70	35	58	26	56	23	85	R. M. Hoskinson.
68	50	84	50	67	41	55	36	55	36	73	Signal Service.
72	47	72	40	68	32	58	28	63	30	61	Do.
86	44	83	41	74	35	55	24	57	20	94	Do.
79	42	77	38	62	31	55	24	55	24	73	Do.
77	44	73	37	63	36	53	28	56	30	....	Do.
84	63	80	57	....	....	....	....	....	....	....	Do.
102	48	98	36	82	23	54	15	50	14	132	Do.
105	42	86	46	90	23	55	14	46	12	136	U. S. post hospital.
83	55	80	45	67	34	55	28	56	26	83	Edw. N. Fuller.
71	48	70	48	63	42	56	36	59	38	58	Signal Service.
84	46	69	47	68	31	54	25	61	26	77	U. S. post hospital.
....	....	87	38	75	29	59	23	57	20	....	Do.
89	55	85	49	76	40	55	30	54	26	85	Mrs. C. B. Carpenter.
102	53	100	44	81	33	63	18	64	18	119	Signal Service.
104	50	84	53	81	28	61	17	64	19	123	U. S. post hospital.
....	....	....	....	....	....	....	....	....	....	....	R. T. Lowndes.
88	48	75	32	68	30	65	15	....	....	....	W. C. Tabb.
93	40	80	32	72	28	72	18	58	2	101	Dr. C. F. Stucky.
86	40	74	30	68	25	69	16	51	4	95	S. F. H. Hewit.
96	47	83	33	74	28	76	24	63	12	....	Signal Service.
90	48	80	33	72	29	75	22	54	13	97	Theo. G. Field.
90	48	84	34	74	36	77	23	64	13	....	R. D. J. Echols.
....	....	85	32	74	31	78	22	60	14	....	F. M. Swann.
91	46	69	46	....	....	....	....	....	....	....	Beloit College Observatory.
86	50	78	26	75	21	68	12	50	7	122	George L. Collie.
97	40	83	24	h78	h19	69	2	....	....	....	G. H. Kruschke.
87	42	80	35	72	28	65	6	56	—10	130	J. E. Breed.
87	39	80	26	71	24	67	9	50	3	136	J. C. Wedge.
92	48	78	28	70	26	61	10	50	5	127	B. H. Meyer.
89	40	80	32	69	25	64	9	49	5	128	Signal Service.
91	50	82	29	73	26	69	9	56	2	133	Do.
98	42	84	26	....	....	....	....	....	....	....	Edw. Pollock.
91	50	78	33	72	28	67	14	51	11	120	Washburne Observatory.
90	42	78	33	72	25	62	11	54	8	121	Miss Clasina Lüps.
90	49	82	34	73	30	70	14	52	13	114	Signal Service.
....	....	....	....	....	....	....	....	....	....	....	College of the Sacred Heart.
....	38	....	27	....	22	....	6	....	2	....	G. H. Yapp.
86	40	....	....	....	....	....	....	....	....	....	Signal Service.
....	....	....	22	....	13	....	9	66	—26	....	U. S. post hospital.
85	40	88	30	72	16	62	7	61	2	124	Signal Service.
....	....	....	26	....	11	....	5	....	— 3	....	U. S. post hospital.
94	h44	89	29	77	27	69	— 6	63	—13	141	Signal Service.
100	43	87	40	84	......	68	....	....	....	....	U. S. post hospital.
88	42	88	35	77	19	60	2	68	2	131	Signal Service.
87	42	86	32	72	19	59	6	63	3	126	U. S. post hospital.
....	....	....	....	....	....	....	....	....	....	....	Superintendent of Yellowstone National Park.
....	....	....	....	74	19	59	— 3	49	—27	....	U. S. post hospital.
90	38	86	33	74	13	44	— 4	46	—13	136	Do.
88	40	85	34	69	17	60	— 3	52	—16	141	Do.
89	39	86	33	70	13	62	— 6	47	—18	145	U. S. post hospital.

Monthly and annual precipitation (in inches and hundredths) for 1888, *etc.*—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Arkansas—Continued.														
Fulton	3.16	1.18	7.89	2.08	4.00	2.70	......	0.50	......	1.66	3.54	4.69	......	Signal Service.
Helena (1)	5.74	2.40	9.30	3.50	3.29	6.16	3.22	11 18	3.22	3.40	6.01	4.74	62.16	Do.
Helena (2)	2.20	......	7.30	1.80	2.40	5.70	2.30	10.10	1.00	0.00	0.00	3.70	......	State weather service.
Hot Springs	5.80	2.68	4.88	1.86	8.96	9.54	1.22	......	0.70	3.04	4.95	6.99	......	U.S. post hospital.
Heber	1.78	0.60	1.60	......	2.18	3.16	1.00	2.50	2.10	1.80	5.05	2.48	......	State weather service.
Little Rock	4.94	2.49	5.06	0.84	5.09	7.25	3.78	11.13	1.33	2.39	8.82	4.43	57.55	Signal Service.
Lead Hill	2.54	1.81	3.95	1.98	8.95	2.87	1.15	11.53	0.48	3.10	5.13	2.31	45.80	Silas C. Turnbo.
Lonoke	......	8.00	9.50	1.37	7.56	9.00	3.62	7.75	1.62	3.19	9.65	3.38	......	State weather service.
Madison	4.32	0.15	1.44	0.17	0.35	0.54	0.72	1.53	0.14	0.30	0.48	0.29	10.43	Signal Service.
Malvern	......	......	......	0.13	7.06	7.25	0.26	6.24	0.94	......	......	......	......	Do.
Monticello	......	......	......	......	4.29	4.12	2.85	7.45	0.45	6.43	......	......	......	Do.
Melbourne	......	......	......	......	1.91	......	......	......	......	3.36	6.87	......	......	State weather service.
Newport (1)	3.48	3.04	5.55	1.96	2.55	8.43	2.27	5.28	0.96	2.48	8.44	3.27	47.71	Signal Service.
Newport (2)	......	......	......	1.97	2.51	7.70	2.10	4.47	......	0.28	......	3.27	......	Do.
Osceola	4.25	2.20	4.20	2.40	0.48	4.78	1.15	8.32	0.94	2.47	......	......	......	State weather service.
Ozone	......	......	......	......	5.96	10.36	3.54	2.89	1.75	4.60	4.54	7.16	......	Do.
Pine Bluff	......	......	......	4.64	5.10	5.76	5.31	5.24	......	......	......	......	......	Signal Service.
Portia	4.95	5.25	4.30	3.10	7.78	4.75	3.48	9.75	1.21	3.02	3.68	2.60	53.87	State weather service.
Prescott	......	......	......	0.79	2.72	3.69	[1]0.81	0.28	0.10	[b]0.01	0.31	......	......	Signal Service.
Russellville	......	......	4.01	3.90	4.71	5.51	3.70	5.60	0.70	2.20	......	......	......	Do.
Stuttgart	......	......	......	......	......	......	1.70	9.16	1.20	3.42	3.38	4.74	......	State weather service.
Texarkana	0.41	......	......	0.50	0.70	0.09	1.62	0.51	0.59	0.72	2.60	1.88	......	Signal Service.
Washington	6.34	2.69	8.87	6.62	4.19	5.61	4.23	8.50	0.64	1.79	7.06	5.12	61.66	State weather service.
California:														
Alcade	......	......	......	......	......	......	0.00	......	1.10	0.00	4.00	1.68	......	Pacific Railway system.
Alcatraz Island	6.76	0.98	4.16	0.25	0.50	0.17	......	0.00	0.75	0.07	3.55	6.10	......	U. S. post hospital.
Almaden	4.51	1.24	4.73	0.32	0.64	0.16	0.00	0.00	0.67	0.00	4.86	3.72	20.85	Pacific Railway system.
Anaheim	6.29	0.92	5.90	T.	0.00	0.00	T.	0.00	0.00	T.	3.75	4.19	21.05	Do.
Anderson	......	......	......	......	......	......	......	......	0.00	0.00	6.08	8.70	......	Dr. A. Fouch.
Angel Island	5.36	0.30	1.18	0.04	0.13	0.13	T.	0.00	1.15	T.	2.84	4.61	15.74	U. S. post hospital.
Año Nuevo Light-house	7.22	0.84	4.72	0.08	0.98	0.30	0.00	0.00	0.05	0.00	4.55	4.25	22.99	
Antioch	2.84	1.24	2.05	0.00	0.50	0.00	0.00	0.00	0.70	0.00	1.82	2.88	12.03	Pacific Railway system.
Aptos	5.85	1.59	5.32	0.50	0.79	0.25	0.00	0.00	0.45	0.00	5.15	4.31	24.21	Do.
Arcata	11.67	2.57	2.77	1.37	0.90	4.85	......	......	......	1.41	3.40	4.79	......	H. L. Fry.
Athlone	2.29	0.00	1.70	0.30	0.60	0.00	0.00	0.00	0.25	0.00	2.56	1.59	9.29	Pacific Railway system.
Auburn	7.07	1.40	3.25	0.80	0.40	1.55	0.00	......	......	0.00	4.20	5.82	......	Do.
Banning	0.89	3.50	6.93	0.80	0.50	0.00	0.18	0.00	0.10	0.26	5.25	5.70	24.11	Welwood Murray
Barstow	......	......	......	......	......	0.00	0.22	......	0.38	0.38	1.09	0.95	......	George R. Gooding.
Beaumont	1.39	1.18	5.78	0.87	0.40	0.00	0.00	0.50	0.00	0.30	3.92	4.19	18.53	Pacific Railway system.
Berkeley	5.84	1.92	4.50	0.20	0.42	0.50	T.	0.00	0.59	0.02	2.71	3.79	20.49	Professor Soulé.

Benicia Barracks	5.84	0.47	4.32	T.	0.33	0.38	0.01	0.00	0.90	0.00	2.92	3.82	18.99	U. S. post hospital.
Bidwell, Fort (1)	3.28	1.81	3.28	0.16	1.50	2.38	0.34	0.04	0.33	0.20				Signal Service.
Bidwell, Fort (2)	3.01		2.32	0.15	1.37	1.49	0.36	T.	0.34	0.22	1.10	0.77		U. S. post hospital.
Bishop Creek	1.37	0.47	0.92	0.00	0.00	0.35	0.20		0.00	0.00	1.72	0.40		Pacific Railway system.
Boca	3.75	1.10	2.40	0.40	0.51	0.10	0.15	0.30	0.12	0.00	0.95	1.45	11.23	Do.
Borden	0.93	0.17	1.98	0.11	0.47	0.00	T.	0.00				1.21		Do.
Brentwood	4.24	0.40	2.28	0.02	0.59	0.00	0.00	0.00	0.82	0.00	3.71	1.72	13.78	Do.
Brighton	4.67	0.62	2.86	0.30	0.59		0.00	0.00	0.52	0.00	3.94	8.29		Do.
Byron	2.67	1.25	1.77	0.00	0.75	0.00	0.00	0.00	0.59	0.00	4.49	1.81	13.33	Do.
Caliente	0.87	1.14	1.50	0.00	0.81	0.00	0.00	0.00	0.00	0.00	1.33	2.18	7.83	Do.
Calistoga	7.87	2.87	5.64	0.26	0.20	1.16	0.00	0.00	0.89	0.00	6.14	6.91	31.94	Do.
Centreville	3.99	1.80	3.07	0.15	0.78	0.40	0.00	T.	0.39	0.07	3.87	2.53	17.05	William Berry.
Chico	4.95	1.15	1.94	0.15	0.00	1.20	0.00	0.00	0.68	0.00	4.49	5.35	19.81	Pacific Railway system.
Cisco	9.75	2.72	6.10	2.20	1.50	1.20	0.00	0.68	0.15	0.15	9.88	9.88?		Do.
Colegrove (Cahuenga Valley).	7.55	1.13	3.67		0.08	0.00	0.00	0.00	0.00	0.71	4.38	6.47		Seward Cole.
Coles		1.40	1.21	0.24	1.90	2.79	0.85	T	0.85	0.00	1.43	1.32		Pacific Railway system.
Colfax	13.28	2.18	2.80	0.95	0.17	2.69	0.00	0.00	0.25	0.10	3.28	9.57	35.27	Do.
Colton	4.89	0.42	3.68	0.43	0.00	0.00	0.00	0.00	0.00	0.00	2.37	3.26	15.05	Do.
Corning	3.64	2.09	3.20	0.19	0.40	0.79	T	0.00	0.52	0.00	3.34	5.37	19.54	Do.
Crescent City (1)	22.46	3.52	5.86	1.42	1.04	7.30	0.32	0.02	0.50	3.04	5.85	7.07	58.40	D. S. Sartwell.
Crescent City (2)	22.46	3.25	4.55	3.13	0.65	6.49	0.00	0.00	0.00	2.04	4.92	7.19	54.68	State Agricultural Society.
Davis	4.23	1.10	2.80	0.30	0.50	0.00	0.00	0.00	0.65	0.00	5.06	4.20	18.74	Pacific Railway system.
Delano	2.21	0.10	0.94	0.00	0.15	0.00	0.00	0.00	0.00	0.00	1.51	1.19	6.10	Do.
Delta	10.40	4.67	1.70	0.00	2.45	3.30	0.00	0.00				10.56		Do.
Denverton	3.57	1.56	3.18	0.04	0.43	0.28	T	0.00	0.67					S. K. Nurse.
Downey	5.33	0.82	6.32	0.11	0.02	0.00	0.00	0.00	T	0.10	2.94	4.75	20.39	V. M. Hardy.
Dunnigan	4.18	1.03	8.39	0.00	1.62	0.00	0.00	0.00	0.59	0.00	4.59	5.88	21.28	Pacific Railway system.
East Brother Light-house.	2.15	0.24	0.87	0.00	0.05	0.06	0.00	0.00	0.70	0.00	3.40	2.50	9.97	State Agricultural Society.
East Pasadena	6.55	0.57	4.68											
Elmira	4.81	1.49	3.92	T	0.45	0.19	0.00	0.00	0.08	0.00	0.28	4.47	15.69	Pacific Railway system.
Elsinore	6.09	0.80	5.87	0.08	0.09	0.00	0.10	0.00	0.06	0.69	2.93	5.37	22.08	G. W. Varnum.
El Verano								0.00	0.85	0.00	6.05	7.58		Pacific Railway system.
Emigrant Gap	17.05	3.92	5.42	3.30	2.23	3.04	0.62	0.00	0.10	0.00	4.77	7.39	47.84	Do.
Eureka	12.95	1.98	4.09	1.05	0.76	4.66	0.44	T	0.06	1.15	3.41	5.93	36.48	Signal Service.
Evergreen	2.61	1.44	3.32	0.08	0.81	0.24	0.00	0.00	0.57	0.00	2.82	2.07	13.96	S. Holland.
Farallon Islands	3.20	0.53	2.59	0.00	0.05	0.16	0.00	0.00	0.35	0.05	3.30	4.56	14.79	State Agricultural Society.
Farmington	3.82	0.15	3.52	0.07	0.92	0.00	T	0.00	0.65	0.00	2.93	1.75	13.82	Pacific Railway system.
Folsom		0.84	3.08	0.12	0.35	0.27	0.02		0.54	0.00	4.74			Do.
Fout's Springs	10.83	0.70	5.00		2.14	0.65								John F. Fouts.
Fresno (1)	1.75	0.13	1.95	0.22	0.56	T	T	T	0.06	0.00	2.38	1.71	8.76	Signal Service.
Fresno (2)	1.84	0.10	1.99	0.15	0.48	0.00	T	0.00	0.08	0.00	1.84	1.75	8.23	Pacific Railway system.
Galt	3.97	0.46	3.14	0.40	0.39	0.00	0.00	0.00	0.92	0.00	3.87	8.14	16.29	Do.
Gaston, Fort	12.58	5.18	4.32	0.70	1.18	4.20	0.30	0.00	0.00	0.61	2.08	4.55	35.70	U. S. post hospital.
Georgetown	14.21	3.14	6.02	1.18	0.38	1.56	0.04	0.00	0.41	0.00	4.67	7.99	29.60	C. M. Fitzgerald.
Gilroy	5.35	0.77	3.92	0.40	0.44	0.00	0.00	0.00	0.32	0.00	3.71	2.10	17.01	Pacific Railway system.
Goshen	2.11	0.19	1.33	0.12	0.29	0.00	0.00	0.00	0.16	0.00	2.25	1.12	7.57	Do.
Grass Valley (1)	11.81	2.59	5.22	0.50	0.38									Mr. Loutzenheiser.
Grass Valley (2)	12.44	2.46	5.51	0.58	0.55	2.26	0.08	0.00	0.55		4.29	8.70		N. Berriman.
Hollister	2.61	0.97	2.75	0.40	0.80	0.02	0.00	0.00	0.20	0.00	2.20	2.00	11.95	Pacific Railway system.
Hornbrook	1.16	1.08	0.61	T	2.58	2.74	0.15			0.00				Do.
Humboldt	12.39	1.30	3.79	0.65	0.85	4.22	0.37	0.00	0.04	0.89	2.84	6.20	33.54	State Agricultural Society.

Monthly and annual precipitation (in inches and hundredths) for 1888, etc.—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
California—Continued.														
Hydesville	14.81	1.85	3.45	0.83	1.06	3.92	0.27	....	....	0.74	3.03	4.98	....	E. T. Foss.
Indio	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.10	1.11	2.96	Pacific Railway system.
Ione	4.60	0.58	1.16	0.70	0.22	0.00	0.00	0.00	0.36	0.00	2.99	2.48	13.09	Do.
Iowa Hill	6.52	2.41	4.59	1.47	1.14	2.60	0.06	T	0.35	0.00	3.78	....	....	C F. Macy.
Jolon	5 64	0.16	4.81	0.00	0.37	0.01	T	0.00	0.60	0.00	0.64	4.48	21.71	T. T. Tidball.
Fort Jones	....	1.77	2.43	0.18	1.80	4.21	0.60	0.11	0.58	0.40	1.94	1.59	....	J. Titcomb.
Keeler (1)	0.70	1.21	0.30	0.12	0.30	0.20	0.17	0.10	0.06	0.00	1.68	0.82	5.66	Pacific Railway system.
Keeler (2)	0.70	1.21	0.30	0.12	0.30	0.20	0.17	0.10	0.06	0.00	1.68	0.82	5.66	Signal Service.
Keene	1.30	1.70	2.69	0.78	2.03	0.00	0.68	0.00	0.00	0.00	1.28	2.29	12.75	Pacific Railway system.
King City	2.85	0.70	2.76	0.10	0.01	0.00	0.00	0.00	0.72	0.00	....	2.52	....	Do.
Kingsburgh	2.29	0.29	1.64	0.00	0.21	0.00	0.00	0.00	0.08	0.00	1.78	1.83	8.12	Do.
Knight's Landing	4.18	0.91	2.51	0.07	2.45	0.34	0.02	0.00	0.81	0.00	5.72	4.82	21.83	Do.
La Grange	2.84	0.66	2.63	0.17	0.52	T	0.02	T	0.32	0.00	3.29	3.67	14.12	Joseph Dominica.
Lathrop	2.46	0.41	1.09	0.49	0.72	0.00	0.00	0.00	0.78	0.00	2.60	3.21	11.76	Pacific Railway system.
Lemore	1.89	0.00	1.28	0.00	0.88	0.00	0.00	0.00	0.00	0.00	2.04	0.96	7.05	Do.
Lewis Creek	4.09	0.46	2.29	0.10	0.00	0.00	....	0.00	0.07	0.00	2.57	2.87	....	John Tuohy.
Linden	4.10	0.44	2.66	0.20	0.99	0.01	....	....	....	....	....	....	....	I. Green.
Livermore	3.20	0.94	2.54	0.60	0.66	0.30	0.00	0.00	0.76	0.00	3.80	2.21	15.01	Pacific Railway system.
Livingston	2.79	0.29	2.07	0.26	0.22	0.00	0.00	0.00	....	0.00	3.80	2.10	....	Do.
Los Angeles (1)	6.04	0.80	3.17	0.12	0.05	0.01	0.04	0.10	0.03	0.40	4.02	6.26	21.04	Signal Service.
Los Angeles (2)	7.59	1.17	4.63	0.00	0.00	0.00	0.03	0.10	0.00	0.37	4.41	6.67	24.97	Pacific Railway system.
Los Banos	1.83	0.06	1.33	0.00	0.19	T	T	T	0.60	0.00	2.99	1.92	8.92	Adolph Widman.
Los Gatos	5.73	1.47	6.74	0.07	1.00	0.38	0.00	0.00	0.59	6.19	3.88	4.40	30.45	D. Vandenburg.
Mammoth Tank	0.05	0.07	0.05	0.03	0.01	0.00	0.40	0.10	0.00	0.43	0.73	0.87	2.74	Pacific Railway system.
Martinez	4.24	1.65	3.54	0.00	0 10	0.15	0.00	0.00	0.65	0.00	3.06	2.91	16.30	Do.
Marysville	4.58	....	2.55	0.00	0.41	0.32	0.00	0.00	0.00	0.00	4.23	6.27	....	Do.
Mason, Fort	6.11	....	....	0.10	0.40	0.06	....	0.00	0.86	0.04	3.52	5.04	....	U. S. post hospital.
Menlo Park	3.17	1.36	2.31	0.02	0.37	0.09	0.00	0.00	0.98	0.00	3.72	2.59	14.61	Pacific Railway system.
Merced	2.67	0.15	1.68	0.28	0.65	0.10	0.00	0.00	0.50	0.00	2.40	2.12	10.55	Do.
Modesto	1.72	0.53	1.36	0.27	0.69	0.10	0.00	0.00	0.51	0.00	1.80	1.40	8.38	Do.
Mojave	2.62	1.50	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.18	2.23	10.28	Do.
Montague	....	....	0.50	....	....	3.13	0.15	....	0.61	0.16	0.98	....	....	Do.
Monterey	3.95	1.09	3.29	0.23	0.81	0.00	0.00	0.00	0.65	0.00	1.76	2.76	14.54	Do.
Mount Hamilton	....	....	....	....	....	....	0.00	0.02	0.49	0.03	3.27	4.23	....	Lick Observatory.
Napa	4.87	1.33	4.18	0.65	0.88	0.00	0.00	0.00	0.49	0.00	2.96	5.30	20.66	Pacific Railway system.
Needles	....	....	....	....	....	....	1.38	0.06	0.06	0.83	....	1.98	....	John J. Clarke.
Newark	....	....	....	....	....	....	....	0.00	0.65	0 00	3.30	2.68	....	Pacific Railway system.
Newhall	6.74	1.17	4.21	0.29	0.04	0.00	0.00	0.00	0.00	0.40	3.69	5.64	22.18	Do.
Nicolaus	4.97	0.70	2.83	....	0.55	0.15	....	....	....	....	3.27	5.25	....	Alvah Pendleton.
Niles	4.10?	0.30	2.83	0.23	0.60	0.50	0.00	0.00	0.42	0.00	8.70	2.32	15.00	Pacific Railway system.

Nordhoff	7.46	1.28	5.47	0.54	0.26	...	...	...	...	0.00	5.96	7.22	...	R. Robinson.
Oakland (1)	6.42	1.02	4.44	0.10	0.38	0.46	0.92	0.06	3.52	4.82	...	...	...	Dr. J. B. Trembley.
Oakland (2)	6.17	1 38	4.63	...	0.25	0.24	0.00	0.00	...	...	3.64	4.86	...	Pacific Railway system.
Orland	4.11	1.56	2.73	0.57	0.24	0.53	0.00	0.00	0.27	0.00	2.79	3.47	16.27	Do.
Oroville	7.72	0.99	3.44	0.14	0.38	1.16	0.07	...	0.63	0.00	4.14	7.91	...	Hiram Arents.
Pajaro	4.59	0.91	4.27	0.47	0.58	T	0.00	0.00	0.79	0.00	3.29	2.80	17.70	Pacific Railway system.
Paso Robles	5.60	0.30	4.50	0.20	0.28	0.00	0.00	0.00	0.01	0.00	4.02	2.80	17.71	Do.
Petaluma	3.72	2.10	4.85	0.36	1.00	0.30	0.00	0.00	1.24	0.00	4.37	5.83	23.77	Do.
Pigeon Point Light-house	5.49	1.04	3.80	0.00	1.52	0.26	0.00	0.00	0.00	0.00	...	...	...	State Agricultural Society.
Placerville	...	2.39	5.27	0.91	1.10	1.52	0.04	0.00	0.71	0.00	5.90	6.57	...	Pacific Railway system.
Pleasanton	3.23	0.88	2.25	0.20	0.50	0.27	0.00	0.00	0.62	0.00	5.15	1.85	14.95	Do.
Point Arena	11.41	1.29	2.95	0.25	0.75	2.70	0.36	0.00	0.54	0.15	3.33	5.78	29.51	State Agricultural Society.
Point Bonita Light-house	6.96	1.46	3.85	0.28	0.63	0.45	0.00	0.00	1.94	0.40	5.52	6.73	28.22	Do.
Point Conception	6.49	0.90	3.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.23	3.06	15.33	Do.
Point Montara Light-house.	5.63	1.56	4.59	0.01	0.43	0.53	0.00	0.00	0.95	0.21	4.30	6.19	24.40	Do.
Poway	4.01	0.89	4.85	0.10	0.51	0.00	0.00	...	...	...	...	...	...	Adams Chapin.
Presidio of San Francisco	7.18	0.78	3.46	0.00	0.32	0.80	...	...	0.41	0.10	3.52	8.58	...	U. S. post hospital.
Ravenna	2.57	0.82	3.19	0.00	0.00	0.00	0.00	T	0.00	0.75	2.35	2.90	12.58	Pacific Railway system.
Red Bluff (1)	4.47	2.15	3.21	0.48	0.30	2.67	0.00	0.00	0.33	0.00	2.66?	7.92	24.19	Do.
Red Bluff (2)	4.08	2.17	3.47	0.53	0.51	2.61	0.07	0.00	0.33	T	4.32	6.85	24.94	Signal Service.
Redding	9.45	2.70	2.95	0.00	0.73	3.52	0.00	0.00	0.45	0.00	...	7.33	...	Pacific Railway system.
Riverside (1)	4.22	1.01	0.00	0.19	0.02	0.00	0.02	0.00	0.00	0.08	2.47	2.99	11.00	W. E. Keith.
Riverside (2)	4.38	0.90	3.51	0.15	0.04	...	...	...	...	0.10	...	...	...	A. K. Holt.
Rocklin	4.39	0.76	2.05	0.00	0.53	...	0.05	0.00	0.00	0.00	2.73	3.94	...	Pacific Railway system.
Rumsey	...	...	...	...	...	...	...	0.00	0.80	0.00	6.55	5.15	...	Do.
Sacramento (1)	4.81	0.57	3.04	0.10	0.40	0.08	T	T	0.55	0.00	4.28	4.63	18.46	Signal Service.
Sacramento (2)	5.37	0.55	3.80	0.10	0.39	0.39	0.01	T	0.51	0.00	4.06	4.48	19.66	S. H. Gerrish.
Sacramento (3)	4.42	0.57	2.45	0.13	0.27	...	0.00	T	0.42	0.00	4.44	4.44	...	Pacific Railway system.
Salinas (1)	3.74	0.82	2.86	0.38	0.39	0.00	0.00	0.00	0.64	0.00	1.55	2.23	12.61	Do.
Salinas (2)	4.15	0.53	3.28	0.00	0.89	0.00	0.00	0.00	0.56	0.00	1.64	2.23	13,28	Dr. E. K. Abbott.
San Ardo	3.44	0.28	2.91	0.11	0.27	0.00	0.00	0.00	0.00	0.00	3.24	2.31	12.46	Pacific Railway system.
San Bernardino	4.01	3.60	3.41	0.58	0.52	0.03	0.00	0.00	0.00	0.05	4.12	4.64	20.96	Sidney P. Waite.
San Diego	1.96	1.48	2.79	0.10	0.22	0.04	0.01	T	0.04	0.26	1.83	2.84	11.57	Signal Service.
San Fernando	5.09	1.39	3.40	0.44	0.00	0.00	0.00	0.00	0.10	0.36	3.24	5.40	19.32	Pacific Railway system.
San Francisco	6.81	0.94	3.60	0.11	0.38	0.27	0.01	0.01	0.98	0.13	3.99	5.80	23.03	Signal Service.
Sanger Junction	...	...	...	...	...	...	...	0.00	0.21	0.00	2.58	2.02	...	Pacific Railway system.
San José	3.06	1.09	3.00	0.31	0.60	0.22	0.00	0.00	0.60	0.00	3.88	2.44	15.20	Do.
San Luis Obispo	7.10	0.28	3.78	0.14	0.16	0.04	0.00	0.00	0.00	0.00	4.48	3.80	19.78	J. E. Lewis.
San Mateo	4.73	1.21	3.97	0.13	0.67	0.08	0.00	0.00	1.03	0.00	4.16	4.04	20.02	Pacific Railway system.
San Miguel	4.06	0.13	2.34	0.00	0.22	0.00	0.00	0.00	...	0.00	2.44	2.11	...	Do.
Santa Barbara (1)	...	1.12	...	0.07	0.02	0.00	0.00	0.00	0.00	0.03	5.76	5.59	...	Do.
Santa Barbara (2)	10.11	1.30	3.86	0.16	...	T	0.00	T.	0.03	0.07	5.62	5.59	...	H. D Vail.
Santa Clara	3.08	1.68	3.10	0.12	1.28	0.18	0.00	0.00	0.58	0.00	4.37	3.00	17.39	A. Block.
Santa Cruz	8.00	1.93	4.61	0.57	1.08	0.09	0.00	0.00	0.37	0.00	6.17	5.07	27.89	Pacific Railway system.
Santa Maria	4.62	0.43	2.55	0.12	0.14	T	T	0.00	T	T	2.59	5.86	16.31	L. E. Blochman.
Santa Monica	6.98	0.00	6.95	0.00	0.00	0.00	0.00	0.00	0.00	0.58	5.09	6.49	26.09	Pacific Railway system.
Santa Rosa	...	...	...	...	...	...	...	0.00	0.62	0.00	3.48	5.37	...	Do.
Saucelito	4.04	1.54	3.80	0.16	0.31	0.57	...	...	1.04	0.06	4.33	8.13	...	G. Tasheira.
Selma	2.40	T	1.57	0.10	0.31	0.00	0.00	0.00	0.10	0.00	1.46	1.88	7.82	Pacific Railway system.
Shingle Springs	8.82	1.08	4.22	0.43	0.18	0.31	...	...	...	...	4.45	...	...	M. Phelps.
Sims	...	...	7.59	1.00	2.53	4.37	0.14	0.00	0.10	0.00	...	9.21	...	Pacific Railway system.

Monthly and annual precipitation (in inches and hundredths) for 1888, etc.—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
California—Continued.														
Sisson	....	....	0.95	0.00	....	....	....	0.02	0.40	....	2.17	2.91	....	Pacific Railway system.
Soledad	2.86	0.55	2.10	0.15	0.35	0.00	0.00	0.00	0.25	0.00	2.03	1.73	10.02	Do.
Sonoma	5.78	0.70	4.55	0.19	1.42	0.73	0.01	0.00	0.86	0.00	5.02	8.30	27.56	Robert Hall.
South Side	2.57	0.82	3.19	0.00	0.00	0.00	0.00	T.	0.00	0.75	2.35	2.90	12.58	Pacific Railway system.
South Vallejo	4.52	....	0.62	0.00	0.45	0.16	0.16	0.00	0.40	0.00	3.12	3.01	....	Do.
Spadra	6.23	0.98	3.45	0.00	0.00	0.00	0.00	0.00	0.00	0.25	1.50	3.48	15.89	Do.
Steeles	8.60	0.49	3.44	0.36	0.23	0.00	0.00	T.	0.05	0.00	5.45	3.35	21.97	A. T. Mason.
Stockton (1)	3.31	0.48	2.29	0.28	0.55	....	....	....	0.88	....	2.70	2.46	....	Walter M. Trivett.
Stockton (2)	3.00	0.58	1.74	0.55	0.54	0.00	0.00	0.00	0.31	0.00	2.66	2.71	12.09	Pacific Railway system.
Suisun	4.30	1.58	3.97	0.00	0.65	0.30	0.00	0.00	0.70	0.00	3.88	4.48	19.86	Do.
Summit	9.20	1.29	8.05	2.30	1.04	3.72	3.51	0.28	0.00	0.00	....	5.26	....	Do.
Sumner	1.64	1.60	0.31	0.12	0.42	0.00	0.00	0.00	0.00	0.00	....	....	....	Do.
Tehachapi	2.57	2.60	1.20	1.25	0.25	0.00	0.00	0.00	0.00	0.00	0.00	3.65	11.52	Do.
Tehama	4.70	2.40	4.10	0.25	0.25	0.30	0.00	0.00	0.00	0.00	3.61	8.33	23.94	Do.
Templeton	6.05	0.32	5.00	0.38	0.34	0.04	0.00	0.00	0.07	0.00	4.53	3.20	19.93	Do.
Tracy	1.99	0.84	0.61	0.00	0.54	0.19	0.00	0.00	0.35	0.00	2.85	1.71	9.08	Do.
Traver	....	....	....	T	0.11	0.00	0.00	0.00	0.18	0.00	2.33	2.20	....	Do.
Tropico	6.25	1.32	4.20	0.15	0.10	0.00	0.00	0.00	0.00	0.68	3.34	3.51	19.55	Do.
Truckee (1)	3.43	12.50	0.16	0.00	2.04	0.37	0.40	T.	0.00	0.00	0.00	4.80	23.70	State Agricultural Society.
Truckee (2)	2.35	0.00	0.00	0.30	0.70	0.80	0.72	0.20	....	0.00	....	1.58	....	Pacific Railway system.
Tulare	2.89	0.19	1.14	0.00	1.11	0.00	0.00	0.00	0.18	0.00	1.66	1.38	8.55	Do.
Turlock	2.19	0.19	1.11	0.18	0.52	0.00	T	0.00	0.82	0.00	2.75	1.28	9.04	Do.
Ukiah (Vichy Springs)	9.55	2.01	4.85	0.06	0.21	1.29	0.46	....	....	....	....	....	....	William Doolan.
Upper Mattole	41.63	4.13	8.96	1.51	0.48	4.19	0.11	T	0.00	1.06	4.86	13.62	80.55	W. N. Roscoe.
Vacaville	6.93	....	4.23	0.13	0.52	0.19	0.05	0.00	0.65	0.00	5.94	5.67	....	G. O. Coburn.
Walla Walla Creek	....	1.77	2.43	0.18	1.80	4.21	0.60	0.11	0.58	0.40	1.94	1.59	....	J. Titcomb.
Walnut Creek	4.35	0.90	3.42	0.08	0.00	0.00	0.00	0.00	0.40	0.00	3.00	2.34	14.49	A. L. Bancroft.
West Butte	3.75	1.12	2.69	0.30	0.36	0.30	0.00	0.00	0.75	....	....	....	....	A. S. Noyes.
Westport	16.61	2.04	4.83	0.73	0.79	5.61	0.22	T	0.40	0.22	....	....	....	
Wheatland	4.13	1.06	2.42	0.16	0.38	0.35	0.02	T	0.82	0.00	2.69	5.06	16.59	W. M. Lumbard.
Williams	2.22	0.70	1.72	0.00	0.67	0.08	0.04	0.00	0.50	0.00	4.10	2.67	12.70	Pacific Railway system.
Willows (1)	3.18	0.40	1.69	0.11	0.16	0.24	0.06	T	0.88	0.00	3.33	4.11	13.66	David Bentley.
Willows (2)	2.99	1.38	1.82	0.08	0.24	0.29	0.00	0.10	....	0.00	2.43	3.61	....	Pacific Railway system.
Winters	....	....	....	....	....	....	....	0.00	0.89	0.00	8.39	6.44	....	Do.
Woodland	4.25	1.27	2.38	0.10	1.10	0.00	0.00	0.00	0.56	0.00	5.57	4.97	20.20	Do.
Yerba Buena Light-house	5.10	1.29	2.92	0.00	0.41	0.05	0.00	0.00	0.06	0.00	2.47	3.13	15.43	State Agricultural Society
Colorado:														
Akron	....	....	....	0.45	....	0.00	1.25	....	0.10	....	....	....	....	State weather service.
Alma	....	....	0.43	0.99	0.76	0.52	1.97	1.52	0.34	1.32	0.36	0.02	....	Do.
Aspen	....	....	....	....	3.42	1.10	2.24	2.88	0.07	1.76	1.59	0.41	....	Do.

Burlington	...	...	...	...	...	1.27	0.81	4.36	0.10	0.56	...	...	...	Do.
Cañon City	1.87	0.30	0.67	1.61	1.16	0.00	1.36	2.38	T	0.62	0.74	0.00	10.71	Do.
Climax	...	...	...	1.05	1.91	0.98	1.55	2.36	0.50	1.21	1.00	...	...	Do.
Fort Collins	0.29	0.36	0.73	1.23	3.39	0.47	0.60	1.01	0.29	0.88	0.38	0.16	9.79	Prof L. G. Carpenter.
Colorado Springs	0.10	0.45	0.28	1.51	2.42	0.01	1.91	1.18	0.13	0.84	0.22	0.07	9.12	Signal Service.
Como (near)	0.33	0.52	1.59	1.24	1.66	1.13	2.84	2.18	0.19	1.45	0.40	0.09	13.52	State weather service.
Delta	...	...	...	...	...	...	...	...	T	1.79	2.15	0.67	...	J. A. Curtis.
Denver	0.11	0.37	1.15	1.71	2.66	0.29	0.41	0.51	0.11	0.77	1.33	0.69	9.51	Signal Service.
Eastonville	...	...	...	...	...	...	1.23	0.70	0.15	0.50	0.14	...	...	State weather service.
Echo Park Farm	...	...	...	...	...	0.32	1.58	1.68	0.36	1.69	...	...	...	Do.
Forest Glen	...	0.87	0.16	0.69	...	...	...	...	...	...	...	...	...	Do.
Georgetown	0.36	0.39	0.48	0.98	2.83	0.96	2.82	1.96	0.07	0.98	0.70	0.11	12.64	W. A. Jayne, M. D.
Glenwood	...	...	...	0.34	1.28	...	1.23	2.70	0.22	1.72	2.22	1.97	...	State weather service.
Grand Junction	0.98	0.39	0.46	0.56	0.17	...	...	...	...	...	...	...	...	Do.
Greeley	0.05	0.30	0.57	...	...	...	1.29	1.77	...	0.36	0.48	0.06	...	E. Bethel.
Gunnison	...	...	...	...	...	...	3.28	1.17	0.13	0.78	0.26	0.00	...	State weather service.
Home	...	...	...	0.50	...	0.46	2.03	2.70	...	...	...	...	...	Do.
Husted	0.50	0.15	0.30	1.66	5.33	0.02	1.78	1.34	0.19	0.84	0.22	0.02	12.35	Do.
Idaho Springs	...	...	...	...	4.13	0.67	2.69	2.22	0.23	1.07	0.63	0.05	...	Do.
Julesburgh	...	...	...	...	5.81	1.33	1.06	1.64	0.10	0.56	...	0.02	...	Do.
Las Amimas	0.06	0.59	0.64	2.59	0.58	...	...	...	...	...	...	...	...	Signal Service.
Leadville	...	...	...	...	...	0.35	1.17	1.06	0.27	1.30	0.58	0.31	...	State weather service.
Lewis, Fort	0.38	0.20	1.40	1.42	0.24	0.02	1.54	1.14	0.42	1.27	1.74	1.19	10.96	U. S. post hospital.
Longmont	...	...	...	1.26	4.11	0.04	1.21	0.54	0.03	1.81	0.28	...	...	State weather service.
Lyon, Fort	...	...	...	...	...	...	...	...	0.04	0.63	0.14	T.	...	U. S. post hospital.
Minneapolis	...	...	...	3.64	2.36	0.53	2.93	...	...	...	...	...	...	State weather service.
Monte Vista	0.50	0.88	0.16	1.46	...	0.00	0.37	0.71	0.23	1.15	0.35	0.00	...	Do.
Montrose	0.45	0.38	0.60	0.42	0.84	0.05	0.51	1.48	0.16	1.66	1.74	0.21	8.50	Signal Service.
Morgan, Fort	...	1.01	0.08	1.29	...	...	...	...	...	...	...	...	...	State weather service.
Ouray	...	...	...	...	...	0.27	1.54	2.67	0.26	4.06	3.66	0.77	...	Do.
Paoli	...	...	...	...	...	...	...	0.87	0.10	0.44	T.	...	...	Do.
Pike's Peak	0.26	1.15	1.47	2.09	2.40	1.01	4.16	2.63	0.93	...	...	...	...	Signal service.
Plattville	...	...	...	...	...	...	...	6.68	1.45	T.	0.07	0.02	...	State weather service.
Pueblo (1)	...	...	0.20	2.38	0.69	0.00	...	...	...	...	...	...	...	Do.
Pueblo (2)	...	...	...	...	...	...	1.33	0.64	0.04	0.48	0.59	0.10	...	Signal service.
Red Cliff	...	0.52	1.46	1.26	2.13	0.79	...	...	...	...	...	...	...	State weather service.
Rocky Ford	...	...	...	...	...	...	...	...	...	0.53	0.30	0.01	...	F. Watrous.
Saguache	0.10	0.00	0.14	0.67	0.61	0.16	0.88	0.79	T.	1.05	0.00	4.41	...	State weather service.
Springfield	...	...	...	...	...	2.16	5.55	1.14	0.49	0.67	0.27	...	...	Do.
Thon	...	...	0.41	2.05	4.03	0.14	1.87	1.97	0.09	0.65	0.06	0.06	...	Do.
T. S. Ranch	0.16	0.20	1.08	0.70	1.97	0.04	1.42	2.48	T.	1.10	1.55	0.82	11.54	Do.
Walden	0.15	1.29	1.05	2.25	1.93	0.30	1.45	1.93	0.07	1.15	...	...	...	Do.
Wigwam	...	...	...	...	...	0.13	0.34	1.42	T.	0.85	0.55	T.	...	Do.
Connecticut:														
Birmingham	...	...	...	...	...	...	...	6.56	7.67	3.44	4.79	5.76	...	New England Meteorological Society.
Canton	4.16	5.01	4.64	2.89	4.43	1.40	3.14	3.72	9.92	5.95	4.74	5.45	55.45	Do.
Clark's Falls	...	...	...	...	...	...	...	7.72	9.62	5.21	8.01	4.21	...	Do.
Hartford (1)	...	...	...	...	...	...	1.90	4.81	7.08	6.10	5.19	5.91	...	Do.
Hartford (2)	7.68	5.77	5.09	2.06	4.51	1.06	2.33	5.98	7.82	5.38	5.31	5.92	58.91	William R. Matson.

Monthly and annual precipitation (in inches and hundredths) for 1888, etc.—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Connecticut—Continued.														
Lake Konomoc	7.03	4.54	5.90	1.71	4.27	0.93	2.21	....	8.34	4.40	7.71	5.31	....	New England Meteorological Society.
Mansfield	....	....	....	....	....	2.10	1.93	4.97	8.45	6.35	4.94	5.28	....	Do.
Middletown	5.99	4.29	8.78	1.72	4.38	1.86	1.92	6.14	7.81	6.11	6.16	5.55	60.71	Do.
New Britain	....	....	....	....	....	....	....	4.66	7.95	5.72	....	....	....	Do.
New Hartford (1)	3.22	7.07	2.97	2.65	3.98	1.65	4.34	3.90	9.58	5.67	4.44	5.81	55.28	Rev. William Goodwin.
New Hartford (2)	5.52	....	6.41	1.76	3.86	1.82	3.23	5.26	9.92	....	4.24	6.68	....	New England Meteorological Society.
New Haven	5.48	3.16	7.46	2.57	6.03	2.15	1.76	7.10	7.68	6.46	4.73	5.68	60.26	Signal Service.
New London	4.78	2.33	5.96	2.26	4.90	1.28	1.35	3.81	7.32	3.77	5.46	2.39	45.61	Do.
Pomfret	....	....	....	....	....	....	....	6.29	8.95	4.84	6.02	....	....	New England Meteorological Society.
Shelton	6.08	4.84	6.49	2.79	6.91	3.52	2.42	7.43	7.35	7.64	5.60	5.91	66.98	Do.
Southington	4.78	4.65	7.40	1.81	3.15	1.53	1.85	5.15	7.80	4.70	4.33	6.13	53.28	Luman Andrews.
Uncasville	8.03	4.16	9.71	2.68	6.95	1.06	1.75	6.00	9.45	5.45	8.12	5.39	68.75	New England Meteorological Society.
Vernon Center	....	....	....	....	....	....	....	5.60	9.65	4.43	4.34	....	....	Do.
Voluntown	6.75	4.20	8.45	2.45	4.80	0.95	1.75	4.95	8.25	4.40	8.39	4.81	60.18	Rev. E. Dewhurst.
Wallingford	7.00	4.30	7.10	1.91	5.27	2.74	2.18	6.18	7.21	6.52	4.42	5.80	60.63	New England Meteorological Society.
Waterbury	4.73	5.11	6.46	1.78	4.13	1.55	2.73	4.53	7.57	4.72	5.86	5.84	55.01	Do.
West Simsbury	....	....	....	....	....	....	....	3.67	8.88	5.29	4.27	5.40	....	Do.
Dakota:														
Abraham Lincoln, Fort	0.90	0.98	0.50	2.04	0.64	5.96	3.32	0.58	0.20	0.25	....	0.10	....	U. S. post hospital.
Bismarck	0.96	0.44	0.87	0.11	0.70	5.77	3.96	1.73	0.33	1.02	0.38	0.24	16.51	Signal Service.
Brookings	....	....	....	....	....	....	1.61	3.21	0.56	0.62	....	0.05	....	Dakota Agricultural College.
Buford, Fort	0.47	0.33	0.44	0.61	0.96	6.75	2.12	1.61	0.62	0.62	0.10	0.07	14.70	Signal Service.
Davenport	....	....	....	1.06	1.82	2.04	3.04	1.24	0.52	1.04	0.06	0.05	....	J. W. Leech.
Garden City	0.40	0.40	1.79	2.85	2.25	1.10	4.55	2.97	0.60	0.37	0.09	0.15	17.52	W. C. T. Newell.
Grand View	....	....	....	....	....	....	....	....	....	0.42	0.15	0.22	....	Joseph F. Angus.
Huron	0.78	0.52	1.22	0.88	4.98	1.10	3.11	3.46	0.19	0.29	0.34	0.18	17.05	Signal Service.
Kimball	0.40	0.20	1.05	1.00	4.00	1.77	0.90	2.15	0.15	0.60	0.10	0.20	12.52	A. S. Stuver.
Meade, Fort	1.65	1.29	0.75	0.20	3.94	5.50	2.64	3.54	....	0.14	0.16	0.17	....	U. S. post hospital.
New England City	....	....	....	....	....	....	0.90	1.35	T.	0.48	0.05	0.25	....	Lewis A. Dodge.
Parkston	0.60	0.08	1.55	1.84	8.98	1.16	2.15	....	....	....	0.10	0.20	....	John J. Swartz.
Pembina, Fort	0.17	0.26	0.98	0.69	0.56	8.41	3.06	0.45	1.10	1.48	0.35	0.48	17.99	U. S. post hospital.
Randall, Fort	0.20	0.47	0.92	1.30	5.66	2.64	....	3.71	0.66	0.66	....	0.66	....	Do.
Rapid City	0.33	1.62	1.76	0.41	6.01	4.74	1.69	4.76	0.02	0.43	0.47	0.51	22.75	Signal Service.
Richardton	4.00	1.87	2.00	....	0.86	8.23	4.05	....	....	....	....	....	....	Professor A. Nordberg.
Sisseton, Fort	0.25	0.17	0.59	0.60	1.90	1.56	3.48	2.10	0.08	0.60	....	0.08	....	U. S. post hospital.

Spring Lake	......	......	......	......	......	......	......	......	......	0.75	0.05	0.28	......	A. Gould.
Sully, Fort (1)	0.37	0.34	0.47	0.51	2.45	3.61	3.40	2.40	0.10	0.21	0.11	0.26	14.23	U. S. post hospital.
Sully, Fort (2)	0.37	0.35	0.49	0.53	2.63	3.73	3.47	2.50	0.12	0.21	0.11	0.26	14.77	Signal Service.
Totten, Fort (1)	0.63	0.09	0.79	0.65	0.60	7.41	3.34	0.90	0.47	0.87	0.27	0.11	16.13	Do.
Totten, Fort (2)	1.19	0.22	1.37	0.46	0.57	7.57	2.95	0.98	0.49	0.76	0.27	0.06	16.89	U. S. post hospital.
Webster	2.29	1.00	1.93	2.42	2.09	1.99	2.88	4.14	0.48	1.35	0.20	0.40	21.17	Arthur Betts.
Woonsocket	......	......	......	0.86	4.56	1.99	1.62	0.82	0.17	0.47	0.10	0.08	......	L. O. Libby.
Yankton	0.37	0.41	1.24	2.16	8.56	1.03	1.91	3.29	0.50	0.55	0.19	0.68	20.89	Signal Service.
Yates, Fort (1)	1.23	1.07	1.42	0.14	0.69	7.01	2.70	2.02	0.14	0.39	0.17	0.15	17.18	Do.
Yates, Fort (2)	0.09	0.16	0.40	0.30	0.80	7.92	3.66	2.32	0.20	0.11	0.08	0.20	16.24	U. S. post hospital.
Delaware:														
Newark	......	......	......	......	......	......	......	......	0.26	4.01	3.86	4.44	......	Prof. George A. Harter.
District of Columbia:														
Kendall Green	2.90	......	......	1.88	4.86	......	0.36	......	......	3.44	2.44	3.61	......	Deaf and Dumb Institution.
Washington reservoir (receiving),	3.73	3.37	5.13	2.09	4.60	3.74	3.56	4.36	8.93	3.82	3.38	4.17	50.88	Washington water-works.
Washington reservoir (distributing).	2.60	3.58	4.96	2.27	5.47	3.61	3.10	4.48	9.74	4.00	3.72	3.87	51.40	Do.
Washington	2.99	3.19	4.53	1.89	4.77	3.53	4.47	3.35	6.82	3.27	2.97	3.27	45.05	Signal Service.
Florida:														
Altamonte Springs	......	......	......	......	......	......	......	9.74	7.47	2.26	3.68	6.43	......	E. P. Tebeau.
Alva	0.10	4.25	1.10	2.00	5.35	11.36	5.95	8.34	11.82	5.46	4.56	2.60	62.89	Charles E. Robins.
Archer	0.87	5.41	1.34	1.33	9.16	1.97	3.74	5.91	10.82	5. 2	7.61	4.49	57.87	Dr. J. C. Neal.
Cedar Keys	0.77	3.78	0.94	0.09	1.70	4.86	4.11	2.26	12.89	2.43	5.43	3.87	43.13	Signal Service.
Duke	0.68	7.35	1.52	0.94	3.99	4.48	......	3.96	11.86	2.49	......	......	......	Bennett P. Ferrill.
Fort Meade	T.	5.18	2.32	0.60	5.95	4.08	10.17	7.00	8.07	2.06	3.71	9.56	58.70	A. H. Adams.
Homeland	0.15	8.95	2.70	0.35	6.05	3.75	4.45	5.60	9.90	3.20	4.25	6.70	51.05	J. S. Wade.
Jacksonville	0.49	4.38	1.57	0.93	5.46	2.92	8.30	4.89	11.15	6.00	4.16	2.88	53.13	Signal Service.
Jupiter	1.50	3.27	1.25	4.08	8.86	5.52	3.72	4.44	8.72	3.78	3.98	3.26	52.38	Do.
Key West	0.37	0.51	0.91	1.15	2.65	0.88	9.04	2.00	5.45	3.42	4.74	4.46	35.58	Do.
Limona	0.52	5.89	3.19	0.34	4.68	4.25	......	......	......	......	......	......	......	J. G. Knapp.
Live Oak	......	......	......	......	......	2.49	2.83	5.83	6.02	......	......	......	......	Signal Service.
Manatee	0.30	6.82	3.01	0.12	6.28	3.72	7.26	9.96	10.02	2.32	5.33	5.36	60.50	Mrs. Mary W. Broberg.
Merritt's Island	0.74	6.01	1.46	1.69	2.46	4.68	5.65	2.45	8.01	3.31	3.15	8.55	48.16	Rev. J. H. White.
Micco	......	......	......	......	......	......	......	......	7.17	4.95	5.11	11.17	......	Signal Service.
Pensacola	4.14	6.86	8.90	1.60	4.81	7.42	2.20	9.58	4.78	2.49	4.71	4.42	61.91	Do.
St. Francis Barracks	0.10	9.20	1.35	1.15	4.65	2.10	3.40	4.10	4.80	4.00	7.00	6.30	48.1[illegible]	U. S. post hospital.
Tallahassee	1.15	8.10	5.45	0.30	10.40	5.28	3.45	7.41	7.90	8.80	6.10	4.15	68.49	Rev. W. H. Carter.
Titusville	0.74	7.11	2.16	2.59	2.92	6.56	5.62	4.40	6.35	3.75	8.68	9.08	59.96	Signal Service.
Georgia:														
Allapaha	......	......	......	......	......	4.47	1.49	2.83	11.08	8.46	......	......	......	Do.
Andersonville	4.76	......	......	......	......	......	3.15	4.00	7.70	5.57	4.65	2.64	......	H. W. Bryant.
Athens (1)	4.53	6.23	6.64	1.40	5.55	1.89	1.79	4.07	10.59	5.09	6.61	4.64	59.33	Prof. L. H. Charbonnier.
Athens (2)	......	......	......	......	......	1.41	2.50	3.42	11.25	4.77	......	......	......	Signal Service.
Atlanta	3.89	5.91	8.16	1.34	6.86	4.71	1.85	3.89	14.26	3.99	4.70	5.42	64.98	Do.
Augusta	4.25	4.54	7.79	0.87	4.59	1.78	1.79	3.85	7.66	6.37	2.34	4.05	49.88	Do.
Bainbridge	......	......	......	......	......	5.81	5.83	6.37	6.06	5.65	......	......	......	Do.
Camak	......	......	......	......	......	2.73	3.68	3.80	16.92	3.50	......	......	......	Do.
Cartersville	......	......	......	......	......	4.55	1.28	3.06	9.34	2.17	......	......	......	Do.
Chauncey	3.70	9.07	4.13	0.30	4.66	......	......	......	......	......	......	......	......	Report of Commissioner of Agriculture.

Monthly and annual precipitation (in inches and hundredths) for 1888, *etc.*—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Georgia—Continued.														
Columbus				2.16		4.30	4.64	15.56	12.00					Signal Service.
Duck								8.10	6.40	5.16	8.48	2.70		A. L. Gillespie.
Eastman						3.72	3.11	3.62	7.08	3.70				Signal Service.
Forsyth	6.34	7.37	11.50	0.55	5.91	2.84	3,08	2.50	8.69	4.66	5.41	4.58	63.43	Thomas G. Scott.
Fort Gaines						4.78	1.80	2.72	2.79	3.71				Signal Service.
Gainesville		4.90	11.30	2.80		1.66	0.88	3.59	12.61	3.43				Signal Service, and report of Commissioner of Agriculture.
Griffin						5.04	6.46	7.17	10.14	4.38				Do.
Hephzibah										0.30	0.90	1.20		R. L. Rhodes.
Jessup						5.34	4.01	11.97	8.19	9.55				Signal Service.
La Grange	3.62	8.48	9.84	1.25	6.78	7.73	5.17	6.90						Report of Commissioner of Agriculture.
Macon						5.71	3.45	5,61	10.65	2.61				Signal Service.
Marietta		4.47			3.11	1.72	2.48	2.94	9.46	3.80	4.68	5.24		G. S. Owen, Phillip A. Cobb.
Milledgeville	6.30	6.34	10.80	0.99	5.88	2.66	2.44	4.60	11.00	6.16	4.41	5.60	67.18	S. A. Cook.
Millen						5.62	3.05	5.10	10.98	5.40				Signal Service.
Mossy Creek	4.99		1.04	0.20	6.34	3.92	2.17							Report of Commissioner of Agriculture.
Newnan						6.45	2.48	3.20	9.80	4.53				Signal Service.
Quitman (1)						5.07	2.98	3.32	5.25	2.90				Do.
Quitman (2)	1.50	7.75	4.75	0.55	5.55	5.00	5.20	3.40	6.50	5.20	4.85	4.35	54.60	J. L. Cutler.
Rome	4.95	2.90	9.50	2.95	5.05		1.70	3.97						Report of Commissioner of Agriculture.
Savannah	2.09	3.42	2.24	0.71	3.60	2.59	0.82	7.83	10.34	6.81	3.74	2.87	47.06	Signal Service.
Smithville						4.81	0.31	2.67	5.53	4.59				Do.
Thomasville (1)							4.07	3.90	8.69					C. S. Boudurant.
Thomasville (2)						3.24	3.73	5.96	9.27	8.08				Signal Service.
Thompson	6.40	6.25	10.15	1.25	10.85									Do.
Tuccoa						3.57	5.34	8.50	15.77	5.29				Do.
Union Point						1.73	0.30	2.78	14.66	5.62				Do.
Washington						2.00	1.37	3.10	12.63	1.85				Do.
Way Cross						0.81	0.50		10.02	7.49				Do.
Waynesborough						1.12	1.09	2.28	3.41					Do.
West Point						4.80	3.91	5.67	7.38	4.40				Do.
Idaho:														
Boisé Barracks	1.76	0.40	0.16	0.16	0.26	2.81	0.76	0.28	0.07	0.72	0.26	1.42	9.06	U. S. post hospital.
Boisé City	1.54	0.50	0.51	0.12	0.94	3.24	0.48	0.58	0.06	0.78	1.00	1.34	11.09	Signal Service.
Lewiston	1.58	0.61		0.17	1.13	2.80	0.34	0.56	0.15	1.53	1.37	0.64		Robert Schleicher.
Fort Sherman	5.77	0.62	1.80	1.70	0.58	3.07	0.24	0.26		1.55	2.11	3.75		U. S. post hospital.

Illinois:													
Albion	1.04	1.40	5.33	2.21	3.18	7.35	2.00	10.62	1.52	2.92	6.40	......	......	State weather service.
Aledo	......	1.15	2.81	1.30	4.64	4.33	4.50	3.22	1.84	1.68	2.45	2.09	......	Do.
Ashland	2.80	......	......	......	......	......	......	......	......	......	......	......	......	Do.
Aurora	1.40	1.56	3.19	2.08	5.16	0.98	3.20	5.66	1.89	3.10	3.27	2.61	34.10	M. M. Robbins.
Beardstown	2.80	2.25	3.30	1.15	4.55	7.49	4.22	2.88	1.30	......	......	......	......	Signal Service.
Beason	1.40	1.45	3.41	1.51	8.16	2.46	3.75	2.85	1.60	2.51	2.61	2.37	34.08	State weather service.
Belvidere	1.05	0.72	2.67	2.31	5.39	1.90	6.20	1.95	0.68	1.29	2.52	2.18	28.86	Do.
Benton	0.90	1.52	4.07	1.05	1.75	2.76	1.45	7.42	1.70	1.40	3.40	2.40	29.82	Do.
Brush Hill	......	1.38	......	1.61	8.86	3.43	7.33	1.90	2.27	2.30	2.96	2.93	......	Do.
Cairo	2.80	2.51	4.91	3.08	3.58	5.48	3.32	5.45	0.28	3.24	4.85	2.40	41.90	Signal Service.
Cedarville	0.64	0.26	4.65	1.58	4.75	1.93	3.30	1.55	0.81	1.87	2.40	2.21	25.95	State weather service.
Centralia	2.30	1.80	2.17	1.40	3.62	6.99	3.98	7.80	2.50	3.10	7.50	2.37	45.53	Do.
Charleston	2.97	2.70	3.12	2.43	4.82	6.77	2.35	3.25	1.42	2.37	4.35	2.43	38.98	J. B. Dazey.
Chicago	1.56	1.51	2.99	2.13	6.22	1.66	3.93	2.10	0.98	2.95	2.89	1.94	30.86	Signal Service.
Collinsville	1.93	2.18	3.74	2.36	5.68	8.97	5.25	3.17	2.26	2.85	4.40	2.03	44.82	Dr. J. L. R. Wadsworth.
Dwight	1.03	1.43	3.10	1.42	4.46	2.10	2.44	2.27	0.40	3.26	2.53	2.53	26.97	State weather service.
Eberle	2.50	......	3.32	......	3.95	......	4.49	......	......	......	4.82	......	......	Do.
Fairfield	3.70	2.00	3.49	1.04	2.18	0.12	1.93	5.91	0.44	1.08	1.99	4.01	27.89	Do.
Fairview	1.71	1.25	4.04	......	......	......	......	......	......	......	......	......	......	Do.
Flora	2.39	2.72	5.22	1.62	3.32	4.83	1.79	7.66	1.26	2.35	6.16	1.97	41.29	Do.
Gibson City	2.75	1.25	1.88	2.12	7.12	5.25	......	......	......	4.37	2.90	1.75	......	Do.
Golconda	3.75	1.14	6.59	2.36	2.99	7.00	1.65	4.48	0.72	2.78	4.98	2.14	40.58	Do.
Grand Tower	2.28	2.16	3.63	2.03	3.14	5.48	1.14	8.09	0.80	1.97	4.60	2.78	38.10	Signal Service.
Greenville	2.68	2.75	3.64	2.28	5.00	6.52	6.06	3.92	1.47	2.62	4.59	3.00	44.53	State weather service.
Griggsville	3.11	2.40	3.84	1.25	7.85	9.77	6.81	2.86	4.00	1.88	4.30	2.47	50.54	Do.
Harrisburgh	2.83	2.00	4.80	......	......	......	......	......	......	......	......	......	......	Do.
Hennepin	1.07	1.57	2.54	0.93	6.87	2.29	2.14	1.25	1.21	2.71	3.10	2.22	27.90	Do.
Hoopeston	7.59	3.87	3.05	2.18	8.09	......	......	......	......	......	......	......	......	Do.
Irishtown	2.54	2.77	3.46	1.77	3.95	7.59	3.61	7.18	0.87	2.47	3.58	2.78	42.57	Do.
Jacksonville	2.82	1.82	2.24	1.04	5.54	4.21	6.30	1.53	2.05	2.15	2.00	2.64	34.34	Philip J. Hasenstab.
Joliet	0.90	1.00	2.35	2.10	8.50	1.70	0.70	6.00	0.90	3.30	......	......	......	State weather service.
Jordan's Grove	2.17	3.27	5.18	1.82	2.79	7.23	1.30	10.22	2.26	3.55	4.48	2.49	46.76	Do.
Kampville	......	......	......	0.90	6.12	6.53	3.57	5.20	......	1.02	2.53	1.65	......	Do.
Lacon	2.29	2.65	4.60	1.64	7.52	2.26	3.61	2.20	1.04	3.55	2.83	2.67	86.86	Do.
Lake Forest	1.70	1.30	3.58	1.77	4.29	2.68	1.89	3.46	1.50	2.57	2.86	1.69	29.29	Do.
Lanark	1.39	1.26	4.04	1.52	6.46	2.72	4.96	2.91	1.24	2.40	3.13	......	......	Do.
McLeansboro	2.81	1.57	4.77	1.48	2.79	5.88	2.18	7.76	1.06	2.28	4.88	3.64	41.10	Do.
Mahomet	2.02	1.85	......	......	7.84	4.36	5.38	......	......	......	3.11	2.04	......	Do.
Martinsville	......	1.25	2.22	2.75	......	5.26	......	6.71	1.36	1.13	7.30	......	......	Do.
Mascoutah	2.70	3.10	3.80	1.50	4.80	8.70	1.30	5.60	1.40	3.30	3.20	......	......	Do.
Mattoon	2.65	2.25	3.20	2.15	5.90	8.25	2.25	3.48	1.48	2.44	4.80	2.25	40.60	William Dozier.
Mt. Carmel	3.46	1.66	5.94	1.99	2.50	3.81	3.19	7.15	[d]0.62	2.71	4.69	2.15	39.87	Signal Service.
Mt. Morris	3.10	......	......	......	......	......	4.60	2.70	2.70	4.84	4.20	5.50	......	William Feary.
New Athens	3.60	2.50	2.13	1.90	2.53	5.55	2.28	7.75	2.50	2.40	2.05	2.65	37.84	State weather service.
Old Du Quoin	2.70	2.20	3.50	2.00	3.70	8.10	2.20	6.00	0.70	2.60	4.60	2.50	40.80	Do.
Olney	1.93	1.57	5.25	1.80	2.61	4.41	5.64	9.78	0.91	2.82	7.06	2.65	46.43	Do.
Oneida	1.45	2.50	3.75	1.62	7.90	4.10	3.60	5.25	1.65	3.45	4.15	2.85	42.27	Do.
Oquawka	1.65	0.95	3.20	1.25	5.06	3.37	4.06	3.25	1.00	1.65	3.63	2.75	31.82	Do.
Oswego	1.46	1.54	2.77	1.59	4.67	1.29	3.58	1.09	1.22	2.73	3.21	2.22	27.37	John S. Seeley.
Ottawa	1.80	1.88	3.70	1.23	5.39	2.01	3.58	1.77	0.60	2.71	3.38	2.22	30.27	State weather service.

Monthly and annual precipitation (in inches and hundredths) for 1888, *etc.*—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Illinois—Continued.														
Palestine	1.75	1.47	4.72	2.08	2.40	......	2.30	4.50	0.76	2.55	5.67	......	......	John E. Templeton.
Pana	3.08	3.74	6.08	3.50	6.08	8.74	5.73	6.66	1.66	5.83	6.25	5.55	62.90	State weather service.
Paris	2.75	2.10	3.52	3.52	4.35	4.62	2.94	4.09	2.44	2.66	4.78	2.32	39.09	Do.
Payson	2.99	2.22	4.24	......	......	......	......	......	......	......	......	......	......	Do.
Pekin	2.40	1.63	5.29	2.05	7.81	2.65	7.94	2.38	2.17	2.40	......	2.00	......	Rev. J. E. Terborg.
Peoria (1)	1.87	1.66	4.03	1.18	6.72	1.84	6.48	2.30	4.79	2.29	2.67	2.39	38.22	Dr. Fred Brendel.
Peoria (2)	1.97	1.51	4.00	1.16	7.33	1.81	7.15	2.31	5.44	......	......	......	......	Signal Service.
Philo	3.01	1.85	2.77	2.62	6.68	3.11	5.38	0.35	1.18	4.50	4.41	2.12	37.98	State weather service.
Pontiac	1.40	1.43	2.38	0.90	5.70	3.85	4.22	0.65	0.47	2.35	1.87	1.20	26.02	Do.
Prairieville	2.55	1.40	3.93	1.77	7.08	......	......	......	......	......	......	......	......	Do.
Richview	2.17	3.90	4.22	2.26	3.24	6.54	1.88	7.42	3.26	2.99	4.87	2.24	44.99	Do.
Riley	1.24	1.17	2.34	2.16	4.48	0.81	3.44	4.23	1.00	1.70	1.97	1.87	26.41	John W. James.
Rockford	1.72	1.30	3.03	2.54	6.25	1.27	4.90	1.99	1.05	1.80	2.39	2.58	30.82	T. C. Robertson.
Sandwich	1.45	2.59	3.20	1.70	5.14	2.76	4.68	3.83	1.26	2.95	3.33	2.36	35.25	Dr. N. E. Ballou.
South Evanston	1.40	......	......	2.34	4.88	1.78	3.24	4.14	1.54	2.10	3.88	0.68	......	Dr. M. D. Ewell.
Springfield	3.03	2.03	3.48	1.41	8.61	5.50	4.59	1.43	1.70	3.61	3.41	1.99	40.79	Signal Service.
Sterling	1.25	1.13	3.40	2.40	5.96	......	......	......	......	......	......	......	......	State weather service.
Sumner	1.00	1.60	4.80	1.40	2.70	2.90	2.70	5.40	1.40	2.20	5.35	1.40	32.85	Do.
Sycamore	1.01	1.16	2.59	2.05	5.50	1.27	3.10	4.03	1.09	2.37	1.80	2.16	28.13	Roswell Dow.
Three Mile	2.13	3.20	6.10	......	......	......	......	......	......	......	......	......	......	State weather service.
Vandalia	1.50	1.65	2.32	0.70	6.01	6.95	4.54	4.76	1.25	2.75	4.20	1.60	38.23	Do.
Wapella	7.00	8.00	4.00	2.00	......	......	......	......	......	......	3.50	3.00	......	Do.
Warren	......	1.24	3.59	2.85	5.39	......	......	......	......	......	......	......	......	Do.
Warsaw*	0.00	0.08	0.09	0.08	0.24	0.42	0.22	0.07	0.08	......	......	......	......	Signal Service.
Wataga	1.01	1.45	3.32	1.37	......	......	......	......	......	......	......	......	......	State weather service.
Watseka	2.82	1.50	2.53	2.11	4.96	4.43	2.49	0.61	0.50	2.36	3.20	1.92	29.43	Do.
Wheeling	1.57	1.00	2.45	2.10	5.18	......	......	......	......	......	2.47	......	......	Do.
White Hall	2.86	2.10	3.35	0.99	5.48	5.41	4.52	5.43	2.10	1.83	2.09	......	......	Do.
Willow Hill	......	......	......	......	......	......	......	......	......	1.60	7.79	1.85	......	Do.
Winchester	6.60	2.50	3.90	1.70	8.35	9.19	5.45	0.80	2.45	2.53	4.34	1.53	49.34	Do.
Windsor	2.70	2.47	3.37	2.17	5.34	7.09	2.36	3.56	1.28	2.60	3.20	2.34	38.48	A. H. Hatch.
Winnebago	......	......	......	2.20	5.69	1.13	7.63	2.27	1.18	1.75	2.17	2.65	......	State weather service.
Woodstock	1.32	2.65	3.23	......	......	......	......	......	0.82	......	......	2.55	......	Do.
Indiana:														
Angola	2.57	2.36	3.10	1.64	3.75	5.16	4.34	0.69	3.93	2.20	3.54	1.36	34.64	Do.
Blue Lick	......	......	5.41	2.85	3.60	3.42	3.07	11.59	3.09	3.61	6.48	1.76	......	Do.
Brookville	2.18	......	4.57	......	4.97	2.32	2.37	......	......	......	......	......	......	Do.
Butlerville	2.77	2.80	4.46	1.37	3.32	1.79	3.57	9.02	2.69	3.88	6.51	1.63	43.31	C. F. Hole.
Columbia City	2.21	2.32	2.60	2.46	7.79	......	3.85	0.54	1.28	1.56	3.17	1.73	......	State weather service.
Columbus	2.73	2.28	5.60	1.21	3.29	1.88	2.13	5.31	2.18	3.71	6.20	1.59	38.11	Do.

Connersville	3.43	2.12	4.60	2.17	4.05	3.67	7.18	5.73	1.35	4.76	7.82	1.79	48.17	Robert Hessler.
Crawfordsville	2.75	2.80	......	1.00	4.00	......	3.80	0.50	0.50	......	2.90	0.50	......	State weather service.
Degonia	3.39	3.09	7.45	2.04	2.39	5.26	2.45	11.30	1.35	3.27	6.48	2.09	50.56	Do.
Delphi	4.37	2.52	2.54	3.32	5.06	8.10	2.63	1.12	0.69	3.03	4.78	1.89	40.05	Do.
Evansville	2.13	2.05	7.65	1.95	4.56	5.26	0.88	9.76	0.71	3.13	5.78	2.30	46.16	Signal Service.
Farmland	2.75	1.72	4.99	2.61	4.35	3.85	3.66	5.05	1.46	4.16	5.20	1.85	41.65	State weather service.
Fortville	3.55	1.41	4.66	2.73	4.57	1.89	3.32	......	......	......	......	......	......	Do.
Fort Wayne	2.62	......	4.25	2.36	......	......	......	......	......	......	......	......	......	Do.
Franklin	2.13	1.34	4.44	1.19	4.21	1.37	2.12	......	2.20	3.84	5.63	......	......	Do.
Huntingburgh	5.83	6.36	10.40	......	2.50	4.10	......	9.08	......	4.65	6.94	3.65	......	Do.
Indianapolis	2.81	1.45	4.26	4.05	4.73	2.65	3.33	5.84	1.23	4.03	5.07	1.91	41.36	Signal Service.
Jeffersonville	3.89	2.20	5.60	3.32	2.47	3.40	4.89	13.61	3.32	2.71	6.61	1.56	53.58	J. C. Loomis.
Laconia	3.68	1.90	5.73	2.65	2.57	5.22	2.05	......	......	2.45	5.15	1.00	......	Lafe Crozier.
La Fayette	3.17	1.51	1.78	2.21	3.90	3.35	5.41	2.09	0.40	3.49	4.27	1.68	33.26	Purdue University.
Lagrange	2.61	1.97	2.25	2.21	4.04	4.13	1.94	1.14	......	......	3.35	2.00	......	State weather service.
Logansport	3.50	2.65	3.08	3.33	5.55	4.41	1.80	0.98	......	......	4.37	2.00	......	Thomas B. Helm.
Marengo	5.25	6.30	11.05	4.13	4.92	3.36	4.20	18.00	4.31	5.60	11.20	2.40	80.72	State weather service.
Marion	......	......	......	1.90	1.50	3.45	1.20	0.30	0.11	......	3.40	1.20	......	Do.
Mauzy	3.83	2.41	4.87	1.82	4.83	4.61	4.86	4.84	4.32	4.81	6.78	1.78	49.76	Do.
Mt. Vernon	2.74	1.39	6.80	1.46	4.38	8.64	2.45	11.16	1.08	3.08	4.70	2.09	49.97	Do.
Muncie	2.41	0.75	2.45	1.52	4.08	3.45	2.63	......	......	......	......	......	......	Do.
Princeton	2.70	1.50	5.80	1.50	1.95	2.50	2.60	6.50	0.90	2.90	4.05	1.60	34.50	Do.
Richmond	3.01	1.98	4.96	2.78	3.42	4.04	4.52	3.95	1.47	5.97	6.13	1.64	42.87	Do.
Rockville	2.75	2.00	3.30	2.60	3.60	4.75	3.20	1.20	1.60	2.60	5.80	3.25	36.65	Do.
Salem	2.41	2.46	5.64	2.71	2.16	3.25	5.03	8.65	2.39	3.75	7.25	1.77	47.47	J. W. May.
Scalesville	......	......	......	......	......	......	2.70	10.61	1.24	......	5.05	2.04	......	Urias Wilson.
Seymour	3.51	1.63	5.07	1.87	3.60	2.75	4.90	7.37	1.20	3.59	5.62	1.44	42.55	State weather service.
Spiceland	2.30	1.40	3.76	2.16	......	......	......	......	......	3.91	5.50	2.19	......	Do.
Sunman	2.83	2.28	4.93	2.01	3.70	2.55	3.40	6.24	1.23	4.47	5.76	1.39	40.79	Do.
Terre Haute	2.98	1.64	3.85	3.93	4.44	7.14	3.31	4.65	2.11	2.22	6.29	1.48	44.04	Signal Service.
Vevay	4.20	1.64	4.23	1.90	2.51	1.69	5.92	8.04	4.22	4.13	6.34	1.16	45.98	State weather service.
Vincennes	3.07	1.88	5.44	1.82	2.83	2.82	......	......	......	......	6.79	2.61	......	Signal Service.
Worthington	2.03	1.20	4.70	2.09	4.52	3.25	4.50	5.89	1.31	3.10	4.61	1.97	39.17	State weather service
Indian Territory:														
Gibson, Fort	0.84	1.48	0.86	1.84	5.24	3.74	0.57	2.67	0.15	0.64	3.36	1.84	23.23	U. S. post hospital.
Reno, Fort (1)	0.28	1.11	1.14	2.41	5.02	0.34	3.21	2.90	2.43	1.49	0.42	2.34	23.09	Signal Service.
Reno, Fort (2)	0.43	1.09	1.30	2.28	4.43	0.28	3.19	2.82	1.60	1.52	0.46	1.51	20.91	U. S. post hospital.
Sill, Fort	0.35	2.17	1.10	*3.63	3.01	4.77	3.52	9.73	0.83	2.36	1.62	2.63	35.72	Signal Service.
Supply, Fort (1)	0.48	1.11	0.31	4.73	3.71	1.57	2.48	3.70	1.70	1.15	0.30	0.70	21.94	Do.
Supply, Fort (2)	0.30	0.82	0.18	4.42	2.72	0.84	1.18	2.30	1.20	0.90	0.38	0.26	15.50	U. S. post hospital.
Iowa:														
Albion	......	......	......	1.33	7.19	2.21	......	......	......	......	......	......		Enoch Lewis.
Amana	......	......	3.22	1.40	7.55	1.74	4.38	3.67	1.38	1.59	3.59	1.76	......	Conrad Schadt.
Ames	1.08	1.30	2.86	2.25	6.49	3.65	5.15	3.37	0.85	1.45	......	1.90	......	J. Rush Lincoln.
Auburn	4.47	0.64	2.92	3.27	3.94	2.60	......	......	......	......	......	......	......	Edwin Miller.
Bancroft	1.45	0.45	2.35	5.48	8.45	3.41	......	3.46	1.22	......	......	0.40	......	H. N. Renfrew.
Cedar Rapids	1.39	1.37	3.52	1.74	8.10	2.29	6.03	2.42	1.07	2.35	4.12	2.16	36.56	H. D. Olds.
Clarinda	0.60	1.40	2.35	1.50	7.75	4.90	1.80	4.45	0.60	1.40	2.05	1.20	30.50	A. S. Van Sandt.
Clear Lake	......	0.39	4.23	6.60	7.04	2.16	2.99	2.66	1.57	1.25	0.31	0.65	......	Dr. J. C. Wright.
Clinton	1.59	1.06	3.45	1.48	6.46	2.45	7.07	2.02	0.97	1.97	4.19	3.05	35.76	Luke Roberts.

* Measurements appear to be incorrect.

Monthly and annual precipitation (in inches and hundredths) for 1888, etc.—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Iowa—Continued.														
Cresco	1.74	1.02	4.55	3.68	7.34	3.07	4.52	5.24	0.82	0.85	0.23	2.20	35.26	Gregory Marshall.
Cromwell		1.35	2.48	1.57	10.85	4.55	9.45	8.03	0.27	1.43	3.10	2.32		E. E. and H. C. Harrison.
Davenport	1.54	1.17	2.70	1.57	9.23	3.86	7.31	2.79	1.38	2.81	3.54	2.59	40.49	Signal Service.
Denmark	1.90	1.86	3.87	1.40	5.13	4.96	8.45	2.22	1.05	2.52	2.92	2.07	38.35	G. B. Brackett.
Des Moines	1.15	1.51	3.09	1.45	7.84	2.32	3.42	4.52	0.48	0.84	2.09	2.44	31.15	Signal Service.
Des Moines (5½ miles southeast of).	T	2.00									0.38	2.50		Adolphus Voegeli.
Dubuque	1.20	1.31	3.44	2.58	5.84	5.28	3.59	1.73	2.01	1.62	2.75	1.96	33.31	Signal Service.
Dysart	1.75	1.75	4.20	1.78	6.30	1.20	3.80	2.40	0.95	1.90	1.95	1.35	29.33	Jos. Dysart.
Elkader	2.25	0.16	5.51	4.33	5.25	2.21	5.60	4.20	2.35	1.85	2.20	2.90	38.81	J. M. Hamilton.
Fairfield			2.99	2.08	9.32	4.79								George D. Clark.
Fayette						2.43	4.16	2.14	1.14	1.09	1.51	2.41		R. Z. Latimer.
Fort Madison	1.50	2.50	2.45	2.12	5.54	3.17	5.81	4.98	1.39	0.83	1.43	2.18	33.90	Miss L. A. McCready.
Glenwood		0.91	2.76	0.41	6.11	3.81	2.52	7.56	0.43	1.35	0.37	0.59		Seth Dean.
Grinnell					6.85	2.45	5.35	2.95	1.59	1.73	3.02	1.40		Prof. S. J. Buck.
Hampton				2.15	7.87	2.14	5.78	4.90	2.28	1.35	0.07	0.94		E. C. Grevelle.
Humboldt	0.79	0.57	3.32	4.24	5.54	2,83	4.04	3.75	1.46	2.02	6.00	0.35	34.91	Miss Florence Prouty.
Independence	1.49	1.50	5.08	2.53	5.54	2.27	4.82	2.58	1.13	2.07	1.47	2.03	32.51	Iowa Hospital for the Insane.
Iowa City				1.48	6.70	1.63	4.84	4.98	3.01	1.50	4.17	2.39		Prof. A. A. Veblen.
Keokuk	1.57	2.17	3.45	1.85	5.06	5.42	6.00	2.07	2.13	1.63	2.83	1.61	35.79	Signal Service.
Le Claire	1.60	1.06	2.77	1.49	8.24	4.63	6.56	2.14	0.90					Do.
Logan	1.50	0.90	3.40	5.44	5.74	2.09	5.09	6.44	0.83	0.73		1.86		Mrs. M. B. Stern.
Manson	5.40	1.27	1.85	3.50	3.83	4.12	4.59	3.46	1.84	1.98	0.04	0.99	32.87	W. L. Thompson.
Maquoketa	0.71	1.39	2.57	1.30	5.46	3.56	4.75	4.33	2.55	1.90	3.41	2.23	34.16	A. B. Bowers.
Monticello	1.13	1.48	3.71	1.50	6.10	3.18	6.98	1.71	1.85	2.02	2.77	2.26	34.69	H. D. Smith.
Mount Pleasant						4.24	5.40	5.43	1.47	1.14	2.93	2.60		Prof. Max E. Witte.
Mount Vernon					6.88	1.28	5.15	3.33	2.90		3.33			Prof. Alonzo Collin.
Muscatine	1.49	0.70	3.10		6.78	3.82	3.39	7.24	2.00	1.50	4.43	2.84		J. P. Walton.
Osage	0.97	0.79	4.55	4.34	7.89	3.73	3.14	2.71	1.32	1.30	0.78	0.95	32.47	G. D. Pettingill.
Osceola	1.15	0.91	3.42	1.51	8.34	3.55	7.70	6.50	0.00	0.85	1.90	3.10	38.93	F. M. Kyte.
Oskaloosa (1)	1.05	0.15	*0.29		5.52	1.75	7.29	7.38	1.25	1.40	2.21	1.15		Jos. Boyd.
Oskaloosa (2)	1.18	0.90	3.28	1.63	6.40	4.30	6.06	6.90	1.19	1.20	5.78	1.90	38.72	O. H. Avey.
Sac City	1.45	0.92	3.35	5.49	6.05	2.81	2.56	4.81	1.36	1.20	0.00	0.33	30.33	Caleb Brown.
Sioux City	1.40	0.33	1.56	4.96	5.53	1.21	4.65	6.38	0.56					Signal Service.
Smithland	0.57	0.25	1.60	2.45	11.20	2.60	3.00	5.12	0.35	0.45	T	0.45	28.04	Chas. W. Rice, M. D.
Vinton			4.40	1.71	5.63	1.74	4.18	2.91	0.57	2.32	1.96	1.70		T. F. McCune.
Washington	1.23	0.66	3.17	1.45	6.89	3.85	2.38	3.59	1.27	1.10	3.23	2.19	31.04	William A. Cook.
Webster City	2.42	1.21	3.06	2.50	5.08									E. N. and Geo. W. Lee.
Wesley	1.60	0.95	2.95	6.10	5.75	2.55	5.50	3.70	2.05	0.85	0.10	1.25	33.35	William Ward.

West Bend	4.00		3.90	7.80										J. N. Warren.
Kansas:														
Allison	0.12	0.99	1.42	3.29	6.94	1.06	2.61	1.90	0.36	1.08	0.21	0.01	19.99	John J. Cass.
Belleville	0.80			0.73		5.69		4.23			0.00	0.35		A. B. Graves.
Brookville (1)						3.60	1.00	3.20						State weather service.
Brookville (2)		1.90	0.80	1.70	2.40	3.60	1.70	4.40	0.60	1.40	0.10			Do.
Bucklin							2.80	3.05	2.00		0.31	0.20		Do.
Buffalo Park					1.40	0.66	3.85	0.83	0.00	1.33	0.25	0.15		Do.
Bunker Hill	0.00	0.00		1.50	4.25	2.83	2.40		0.80	0.65	T			Do.
Burr Oak								5.25	0.06			0.10		Do.
Carneiro		0.90	2.05	1.15	2.77	3.08	2.99	4.50		0.65	0.00			Do.
Cawker City	1.30	0.90	1.66	0.20	3.30	2.80	0.30	1.20	0.40	1.00	0.10	0.20	13.36	Do.
Colby							2.05	2.70	0.05	1.05	0.70	0.08		Do.
Coldwater							3.60	3.60				0.20		Do.
Collyer	0.20	0.45	0.30	1.62	1.44	0.50	1.05	0.74	0.00	1.30	0.10	0.05	7.75	Do.
Concordia	0.51	0.46	3.37	0.65	3.98	4.22	1.85	4.97	1.00	1.43	0.58	0.22	23.24	Signal Service.
Dodge City	0.23	0.73	0.93	4.08	2.86	5.16	4.07	3.00	0.78	0.81	0.06	0.23	22.94	Signal Service.
Dorrance				0.25	*3.00				0.25	0.55	0.00	0.20		State weather service.
Dwight						6.00	2.31	4.80	0.90					Do.
East Norway	1.80	1.97	2.45	1.10	5.80		3.30							S. E. Hardy.
Elco							3.95	9.02	0.70	2.82	2.80	0.50		State weather service.
El Dorado	0.46	0.42		3.02										H. C. Ford.
Elk Falls	1.13	1.13	2.07	4.93	2.80	4.69	3.72	7.25	0.83	2.39	1.62	2.41	34.97	Dr. A. C. Williams.
Ellsworth		0.90	3.00	0.70	2.35	1.60	1.40	4.50	0.00		0.00	0.20		State weather service.
Emporia	0.00	1.10	2.47	3.43	2.08	5.44	1.68	5.64	1.46		3.85	3.00		Prof. T. H. Dinsmore, jr.
Englewood						1.36	3.25	2.81	0.24	0.58	0.13	0.26		C. D. Perry.
Eureka				6.55	3.36	3.91	2.70	8.35	0.35					State weather service.
Eustis (Goodland)	0.04	1.21	0.85	3.20	4.20	2.35	2.10	2.55						Do.
Gibson	0.22	0.83	0.70	1.94	2.98	1.49	2.37	1.04	0.00	1.00	0.35	0.80	13.72	Do.
Globe	0.95	1.16	3.73	2.53	1.12	8.10	3.95	8.05	0.93	3.75	3.40	2.09	39.76	William Featherston.
Gorham	0.20			0.25		2.50	2.50	4.50	2.50	0.50	0.33	0.05		State weather service.
Grainfield	0.30	0.20	0.60	8.50	4.40	0.70	6.75	0.30	0.00	2.00	0.00	0.00	23.75	Do.
Grenola	1.40	0.95	2.00	5.00	2.30	4.30	2.20	4.00	1.10	2.10	1.10	2.45	28.90	Do.
Grinnell									0.00		0.02			Do.
Halstead	0.30	1.50	1.50	2.34		4.87	1.85	4.37	1.13			0.48		Do.
Havensville							2.50	8.12	*d* 1.25	1.00	1.25	0.60		L. W. Dennen.
Hays, Fort	2.00	0.15	2.25	1.51	3.18	1.56	1.40	4.00	0.84	0.70	0.10	1.20	18.89	U. S. post hospital.
Hays City				0.35		1.53	4.85	4.30	0.30	0.75	0.10			State weather service.
Hill City							2.40	5.50	1.50					Do.
Horton						4.23	1.76	3.67						Do.
Hugoton							3.55	3.90	1.30					Do.
Independence	1.28	2.23	2.09	6.37	4.82	6.44	0.77	5.00	2.00	3.56	2.32	3.89	40.77	J. M. Altaffer.
Kanopolis	0.11		0.70	0.50	3.35		3.50	4.50		0.12	0.00	0.12		State weather service.
Lawrence	0.93	1.27	5.47	2.58	1.97	8.31	4.28	9.07	0.23	3.74	4.54	1.78	44.17	Prof. F. H. Snow.
Leavenworth	0.93	1.24	4.55	2.32	7.70	7.77	4.87	9.32	0.84	2.60	3.50	1.57	47.21	Signal Service.
Leavenworth, Fort							4.38	9.36		2.56	2.66	1.56		U. S. post hospital.
Lebo	0.45	1.22	2.69	2.75	2.42	6.74	2.51	7.29	0.89	2.07	1.65	0.71	31.39	C. W. Burnett.
Leoti	0.07	1.48	0.75	2.78	2.64	1.08	5.64	2.60	0.02	0.85	0.27	0.24	18.42	Levi C. Vickery.
McAllister	T	2.30	1.10	10.20	2.40	1.00	2.90	3.00	0.00	2.00	0.25	0.20	25.35	State weather service.

*Incomplete.

Monthly and annual precipitation (in inches and hundredths) for 1888, *etc.*—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July,	August.	September.	October.	November.	December.	Annual.	Authority.
Kansas—Continued.														
Manhattan (1)	0.65	2.67	2.48	1.38	2.28	5.22	4.16	4.46	......	......	......	1.21	......	Agricultural College.
Manhattan (2)	0.65	2.87	1.75	1.28	2.22	6.04	4.29	4.20	2.95	2.87	0.90	1.21	31.23	C. P. Blachley.
Manhattan (3)	0.32	2.84	2.36	1.05	2.35	6.84	4.09	4.40	3.05	......	......	......	......	Signal Service.
Monument	0,06	1.60	0.75	3.50	1.80	2.40	1.50	1.70	0.00	1.80	0.50	0.20	15.81	State weather service.
Morse	0.95	2.00	6.25	2.38	2.75	5.00	7.00	11.25	1.00	4.25	2.30	2.00	57.13	R. P. Edgington.
Ninnescah (Cunningham).	0.60	1.01	1.44	2.60	2.02	5.41	2.29	7.28	1.47	1.08	0.35	0.80	26.35	E. Shaw.
Oakley	0.10	1.50	0.40	5.00	......	2.40	......	2.80	0.00	......	0.50	0.20	......	State weather service.
Ottawa	......	......	......	......	1.31	7.91	3.11	......	......	......	......	......	......	Do.
Pence	......	......	......	2.87	2.96	3.85	......	3.59	0.40	......	......	......	......	Do.
Quinter	......	0.65	0.50	2.50	4.30	1.30	4.70	1.10	0.00	1.33	0.50	0.00	......	Do.
Riley, Fort	0.26	1.58	1.62	1.60	1.58	4.17	3.56	5.66	2.10	0.99	0.20	0.62	23.94	U. S. post hospital.
Rome	0.46	1.04	2.54	4.39	4.04	1.90	2.40	4.62	1.89	3.14	1.17	1.03	28.62	State weather service.
Russell	......	......	......	......	5.00	4.00	4.50	4.06	1.00	0.65	......	T	......	Do.
Salina	0.04	0.09	2.40	1.60	2.70	3.30	3.15	3.10	0.50	1.30	0.30	0.30	18.78	John H. Gibson.
Sedan	0.74	1.93	2.33	5.73	4.68	5.30	1.38	7.10	1.26	3.12	1.78	2.47	37.82	J. W. Goodell.
Seneca	......	......	......	......	......	......	4.12	3.58	0.80	2.85	0.96	0.55	......	State weather service.
Sharon Springs	......	......	......	......	......	0.70	4.14	4.10	0.09	2.20	......	......	......	Do.
Topeka	0.72	1.43	3.21	1.36	0.87	9.14	3.00	7.23	0.57	2.89	2.91	1.13	33.96	Signal Service.
Toronto	1.60	1.49	2.09	4.50	1.34	4.73	1.78	6.87	3.91	1.96	2.43	1.88	34.58	State weather service.
Tribune	0.35	1.69	4.92	4.37	1.22	1.07	3.82	1.20	0.01	0.84	0.29	0.11	19.89	S. B. Jackson.
Victoria	1.00	0.30	1.70	1.65	3.87	1.70	2.85	4.27	1.00	0.61	0.10	0.10	19.15	State weather service.
Wakefield	0.53	1.65	2.79	3.53	4.27	4.64	2.19	4.84	1.74	2.12	0.72	0.36	29.38	William P. Cochran.
Waterville	0.55	0.76	3.01	1.41	6.63	......	......	......	......	3.24	0.45	......	......	State weather service.
Wellington	0.65	1.12	1.24	6.49	4.66	4.38	2.73	5.15	2.78	2.33	1.28	0.87	33.68	Do.
Wichita	......	......	......	......	......	......	1.04	7.77	1.89	1.36	1.29	0.71	......	Signal Service.
Wilson (1).	0.18	0.49	2.01	0.86	2.39	4.11	0.99	5.10	0.00	0.84	0.30	0.40	17.67	Miss Lizzie Dolphin and E. Y. Dollenmayer.
Wilson (2).	......	......	......	......	2.69	3.87	......	2.50	......	......	......	......	......	State weather service.
Yates Center	1.60	1.49	2.09	4.50	1.34	4.73	1.78	6.87	3.91	1.96	2.43	1.88	34.58	F. R. Gray.
Kentucky:														
Ashland	......	......	......	......	......	......	5.41	10.70	3.07	......	2.91	1.09	......	State weather service.
Bowling Green	6.15	2.38	5.77	2.45	2.77	6.00	2.15	8.31	3.31	2.09	5.17	1.19	47.74	M. H. Crump.
Burnside	6.19	3.79	5.49	3.44	3.03	3.08	......	......	......	......	......	2.34	......	Signal Service.
Carlisle	2.35	2.36	4.74	4.16	3.15	2.62	3,76	4.18	2.09	3.32	4.45	......	......	W. H. Fritts.
Catlettsburgh	5.02	2.76	3.00	1.90	3.37	2.10	4.87	4.41	3.97	3.44	2.51	0.35	37.70	Signal Service.
Eddyville	2.79	1.99	4.56	2.70	6.00	3.42	1.97	4.97	1.01	1.87	5.26	0.81	37.35	Do.
Falmouth	4.89	2.05	4.05	2.71	2.90	2.76	......	......	......	3.39	5.11	1.23	......	Do.
Frankfort (1)	6.20	1.81	4.52	3.83	4.30	2.88	1.77	10.72	2.77	3.81	5.44	1.64	49.69	Do.
Frankfort (2)	4,60	2.23	5.05	3.68	3.93	3.05	2.41	10.85	2.15	3.51	4.51	1.64	47.61	E. C. Went.

Lexington	4.39	2.93	5.82	3.17	3.29	2.97	4.21	8.76	1.22	3.02	5.15	1.88	46.81	Signal Service.
Louisville	3.26	2.56	5.71	2.99	2.42	3.28	3.59	10.53	2.75	2.84	6.34	1.57	47.84	Do.
Madisonville	......	......	......	......	......	......	0.42	5.07	1.63	1.09	2.21	1.26	......	State weather service.
Millersburgh	......	......	......	......	......	1.95	2.12	3.97	7.35	2.58	3.70	1.10	......	Cadesman Pope.
Shelbyville	......	......	2.95	4.48	3.22	......	......	......	......	......	......	......	......	Signal Service.
Louisiana:														
Abbeyville	......	4.96	4.85	1.81	5.28	6.51	2.82	6.95	1.91	5.34	1.85	6.10	......	State weather service.
Alexandria	2.85	4.12	6.47	1.55	9.25	7.01	2.42	6.60	0.20	3.36	4.84	5.43	54.10	Signal Service.
Amite City	......	......	......	0.97	5.98	4.85	5.86	16.16	2.93	3.91	......	4.52	......	Do.
Baton Rouge	......	4.91	3.61	1.39	......	4.23	......	12.30	......	......	1.91	......	......	Do.
Breaux Bridge	2.25	4.33	3.75	1.45	5.78	2.49	......	......	......	......	......	......	......	Do.
Calhoun	......	......	......	......	......	3.17	1.30	4.15	......	1.40	......	4.20	......	Do.
Cheneyville	2.85	......	......	0.67	5.07	5.13	4.42	5.95	0.04	3.30	1.00	......	......	Do.
Clinton	......	......	8.50	0.03	......	......	3.15	14.05	3.73	4.75	1.55	4.75	......	State weather service.
Coushatta Chute (1)	2.38	......	......	......	......	4.23	2.94	2.53	0.94	0.54	......	6.47	......	Signal Service.
Coushatta Chute (2)	1.19	3.17	5.20	1.95	6.12	4.48	2.80	2.28	0.67	3.63	3.76	6.47	41.72	Do.
Convent	......	......	......	......	......	......	......	......	......	3.71	1.10	5.55	......	State weather service.
Crowley	......	......	......	......	......	......	......	......	......	4.68	3.36	5.72	......	Do.
Delhi	2.70	4.20	6.40	3.40	4.80	2.30	2.90	8.10	1.15	2.15	2.75	4.55	45.40	Signal Service.
Delta	2.86	2.41	5.63	0.74	......	......	......	......	......	......	......	......	......	State weather service.
Donaldsonville	3.36	11.63	5.66	......	......	......	......	15.83	......	4.64	1.83	2.56	......	Do.
Farmerville	......	......	......	1.50	3.99	5.06	2.40	3.67	......	1.50	3.05	5.05	......	Do.
Franklinton	......	......	......	......	......	......	......	14.90	1.61	4.85	1.97	4.78	......	Do.
Girard	5.73	3.74	8.13	2.41	3.32	8.37	0.84	7.65	0.72	1.57	4.25	5.40	52.13	Signal Service.
Grand Coteau	2.70	7.44	5.91	2.68	7.41	3.32	1.89	8.07	0.37	3.82	2.36	4.03	50.00	Rev. C. M. Widman.
Hahnville	......	......	......	......	......	......	......	......	......	4.85	2.20	2.50	......	State weather service.
Houma	......	......	......	......	......	......	......	......	......	5.27	1.72	3.53	......	Do.
Keatchie	......	......	......	2.70	......	2.26	1.65	4.55	......	......	......	......	......	Do.
La Fayette	......	......	......	1.97	6.16	3.37	6.77	9.97	0.70	0.40	......	......	......	Signal Service.
Lake Charles	......	6.25	4.75	......	......	......	......	......	......	......	3.95	4.00	......	State weather service.
Lake Providence	......	......	5.68	3.06	4.88	......	2.20	10.86	1.41	1.73	2.66	4.54	......	Do.
Liberty Hill	3.78	3.90	6.43	1.95	3.78	6.17	1.86	2.92	0.86	3.06	4.64	6.37	45.72	Dr. E. A. Crawford.
Luling	3.09	8.19	5.15	2.40	7.47	7.19	2.45	14.47	1.76	5.64	3.23	3.54	64.58	F. M. Rogers.
Mandeville	3.27	9.02	7.25	3.77	7.90	5.16	1.86	19.61	4.80	3.58	2.13	3.85	72.20	State weather service.
Marksville	......	......	......	......	5.17	2.98	1.82	7.33	0.25	3.62	1.50	2.46	......	Do.
Maurepas	......	......	5.73	0.95	4.96	3.32	3.18	23.44	6.92	4.47	1.30	4.65	......	Do.
Melville	5.36	9.18	6.40	1.96	6.93	3.34	2.28	9.04	3.52	3.88	2.32	6.20	60.44	Do.
Minden	......	......	......	1.69	3.88	3.65	3.16	2.27	1.62	1.79	......	4.58	......	Do.
Monroe	5.34	3.30	5.97	1.21	6.26	4.76	1.88	6.96	1.72	1.86	3.20	4.56	47.02	Signal Service.
Morgan City	1.95	7.60	7.10	0.90	3.85	......	......	......	......	......	......	......	......	State weather service.
Mount Airy	......	......	......	......	......	......	......	......	1.80	5.40	2.05	4.71	......	Do.
Natchitoches	......	......	5.21	2.57	4.17	5.26	4.76	1.91	0.31	1.95	......	......	......	Signal Service.
New Iberia	2.39	6.01	4.31	1.39	5.10	9.27	......	12.73	2.88	3.66	2.20	4.47	......	State weather service.
New Orleans	3.29	11.21	6.45	1.89	9.75	9.09	2.02	22.74	4.15	7.36	1.50	3.68	83.18	Signal Service.
Point Pleasant	2.30	4.19	6.40	1.75	......	1.50	1.80	7.25	0.70	3.45	2.25	5.50	......	State weather service.
Port Eads	1.50	......	2.00	0.40	2.00	4.40	......	13.48	5.49	3.93	3.71	3.46	......	Mrs. C. L. Kleinpeter.
St. Joseph	......	......	......	......	......	5.32	3.70	12.12	......	4.00	2.15	5.18	......	State weather service.
St. Martinville	......	......	4.16	......	3.19	......	3.13	11.60	0.12	......	1.03	......	......	Do.
Shreveport	3.75	2.01	9.00	4.49	3.44	3.24	2.97	3.76	0.91	2.73	3.48	4.98	44.76	Signal Service.
Sugar Experiment Station	......	......	......	......	11.71	12.69	6.49	17.50	......	......	2.50	4.12	......	State weather service.
Thibodeaux	......	......	......	0.79	......	......	......	15.56	1.18	4.28	2.02	5.10	......	Do.

Monthly and annual precipitation (in inches and hundredths) for 1888, etc.—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Louisiana—Continued.														
Trinity	....	....	4.80	1.00	3.33	....	5.15	10.70	T	3.30	....	....	....	State weather service.
Vidalia	3.00	4.62	6.68	1.65	4.58	5.53	4.09	12.36	1.98	2.77	1.85	5.92	55.03	Do.
Maine:														
Bar Harbor	4.81	4.77	4.02	3.00	3.67	1.53	3.24	4.29	6.36	7.84	7.60	5.98	57.11	Joseph Wood.
Belfast	....	1.30	1.65	1.60	....	....	....	....	....	0.50	1.00	0.60	....	New England Meteorological Society.
Cornish	4.85	4.10	2.75	1.36	4.04	1.61	1.74	4.48	7.97	6.57	5.85	2.81	48.13	Silas West.
Eastport	5.08	4.81	4.26	2.01	2.74	1.94	3.46	4.50	5.44	7.95	6.70	4.36	53.25	Signal Service.
Fairfield	1.91	3.27	3.84	1.07	3.18	....	3.60	3.56	6.75	5.44	....	3.11	....	New England Meteorological Society.
Gardiner	5.13	5.90	5.09	2.27	2.48	2.59	2.20	4.33	7.12	6.71	5.98	4.20	54.00	H. Richards.
Kent's Hill	5.15	3.23	5.37	1.74	3.03	2.22	....	3.65	8.57	6.03	4.94	2.52	....	Wesleyan Seminary.
Lewiston	5.98	5.09	5.11	2.87	3.48	3.34	2.62	4.13	7.73	6.04	5.77	3.25	55.41	New England Meteorological Society.
Mayfield	....	....	....	1.42	3.17	2.27	3.48	6.88	5.90	7.93	6.90	3.25	....	Do.
Orono	4.97	6.11	6.48	1.78	2.82	3.65	2.47	4.59	6.97	7.51	6.43	4.96	58.74	State College.
Portland	6.05	5.40	3.72	3.80	3.36	2.79	1.90	4.36	8.22	7.47	7.46	4.71	59.24	Signal Service.
Preble, Fort	....	....	....	....	....	....	....	....	5.20	5.71	6.56	....	....	U. S. post hospital.
Maryland:														
Baltimore	3.35	2.83	4.62	2.11	4.22	3.22	2.82	6.17	4.90	2.99	3.04	3.26	43.53	Signal Service.
Barren Creek Springs	....	....	....	....	....	....	3.55	2.03	5.52	5.21	3.46	1.74	....	Albert E. Acworth.
Cumberland	3.85	2.15	3.25	2.56	3.47	3.76	4.34	8.00	2.95	2.60	2.60	1.53	41.06	E. T. Shriver.
Fallston	4.80	....	6.04	2.93	....	2.70	4.38	3.15	7.69	3.82	3.97	4.78	....	Prof. G. G. Curtis.
Galena	....	....	....	....	....	....	....	....	....	3.97	3.41	3.01	....	Henry Parr.
Gambrill's	....	....	....	....	....	....	....	....	3.40	1.30	....	1.75	....	J. E. Mogue.
Great Falls	3.09	2.96	3.72	1.56	3.07	3.46	3.50	3.98	7.27	2.94	3.85	3.59	42.99	Washington Water Works.
Jewell	....	....	....	....	....	....	....	....	9.15	5.57	5.85	2.15	....	Jos. Plummer.
McDonogh	3.13	3.27	4.66	2.03	3.66	2.03	4.00	4.70	7.86	3.59	3.36	3.61	45.90	McDonogh Institute.
McHenry, Fort	1.42	1.80	5.56	0.89	4.23	3.20	2.62	6.56	5.04	3.68	2.86	3.22	41.08	U. S. post hospital.
Mount St. Mary's	....	1.35	2.75	1.99	2.15	0.11	2.65	1.31	4.85	1.35	3.57	3.30	....	Mt. St. Mary's College.
Woodstock	4.19	3.00	4.58	1.96	3.99	1.68	2.32	5.49	6.87	3.36	3.03	1.90	42.37	Woodstock College.
Massachusetts:														
Amherst (1)	4.36	4.25	6.23	3.32	4.52	5.40	4.21	5.84	11.82	5.60	4.50	4.29	64.34	Miss S. C. Snell.
Amherst (2)	3.87	3.94	5.96	3.08	4.29	5.40	3.63	4.29	10.70	5.19	3.91	3.78	58.04	Massachusetts agricultural experimental station.
Beverly Farms	4.89	3.63	5.22	3.38	5.20	2.63	2.84	6.17	8.79	5.16	7.13	5.58	60.62	New England Meteorological Society.
Blue Hill (summit)	3.52	2.95	6.02	2.07	3.91	1.79	1.48	6.38	9.58	4.66	8.23	5.24	55.83	Do.
Blue Hill (base)	3.84	....	6.31	2.37	3.81	1.66	1.35	6.59	9.08	4.88	9.16	5.57	....	Do.
Blue Hill (valley)	....	....	....	....	....	....	....	6.26	8.82	4.75	9.70	5.50	....	Do.

Boston (1)	3.34	2.93	5.76	2.46	6.40	2.71	1.90	7.18	8.86	4.71	8.58	5.40	60.23	Do.
Boston (2)	2.26	2.36	3.32	2.04	5.20	2.69	1.79	6.53	6.77	3.58	4.97	4.38	45.89	Signal Service.
Cambridge (1)	3.56	3.27	5.26	2.56	4.63	2.51	2.54	7.15	8.28	4.67	7.46	4.78	56.67	Harvard College Observatory.
Cambridge (2)	3.32	3.95	5.55	....	6.36	3.25	2.87	7.08	8.28	4.83	7.70	7.17	....	New England Meteorological Society.
Chestnut Hill	3.88	3.34	5.53	2.44	5.90	2.58	1.98	7.10	9.45	4.54	8.17	5.36	60.27	Do.
Chicopee	5.15	5.22	7.07	2.27	4.23	4.36	2.92	3.30	10.94	5.58	....	....	....	Do.
Clinton	3.84	3.52	4.18	2.47	3.25	2.13	2.33	4.89	7.35	6.08	5.85	5.60	51.49	Do.
Concord	4.31	4.29	5.58	....	....	....	....	....	....	....	....	....	....	Do.
Cotuit	3.57	1.80	4.48	2.05	6.48	2.01	4.42	1.78	9.80	4.34	6.14	4.22	51.09	Do.
Deerfield	6.24	5.87	6.22	3.33	4.52	5.42	1.42	4.10	8.83	6.31	4.36	3.68	60.30	Rev. A. Hazen.
Dudley	2.92	3.09	6.77	2.46	5.18	2.31	1.48	5.24	7.57	6.26	5.68	5.33	54.29	Conant Observatory.
Fall River (1)	4.13	3.55	8.55	2.75	6.75	1.62	4.17	5.04	6.93	3.45	9.20	5.25	61.39	C. V. S. Remington.
Fall River (2)	5.79	3.64	7.45	3.09	7.01	1.62	4.42	5.04	8.38	4.05	10.73	5.04	66.26	New England Meteorological Society.
Fiskdale	2.61	3.08	5.96	2.11	4.29	2.97	2.54	4.47	6.81	4.84	3.82	6.19	49.69	Do.
Fitchburg (1)	3.89	4.56	5.17	3.58	4.35	4.04	2.63	4.79	10.86	5.92	6.43	4.87	61.09	Do.
Fitchburg (2)	4.65	4.30	4.43	3.56	3.80	4.36	1.94	5.01	10.57	5.40	6.28	5.36	69.66	Do.
Framingham	4.16	3.71	6.27	2.58	4.50	2.80	1.59	6.86	8.99	5.29	7.64	5.61	60.00	Do.
Gilbertville	3.88	4.36	6.65	3.17	4.26	....	2.63	4.94	9.84	5.14	5.18	5.22	....	Do.
Groton	3.00	4.15	5.84	3.85	3.41	2.83	2.40	4.20	10.42	6.43	5.32	4.64	56.49	Do.
Lake Cochituate	4.13	3.55	5.16	2.51	4.63	1.96	1.85	6.44	8.69	4.95	7.03	5.66	56.56	Do.
Lawrence	4.44	4.04	4.94	3.44	4.24	2.49	2.82	4.24	7.74	5.92	6.16	4.77	55.24	Do.
Leicester	....	....	....	....	....	....	....	....	....	6.08	3.92	5.76	....	Do.
Leominster	3.95	4.41	5.41	3.68	3.92	4.31	2.67	4.94	10.57	6.05	5.92	5.38	61.21	Do.
Long Plain	5.50	3.57	5.98	2.38	6.26	1.58	5.67	4.28	10.35	3.88	11.47	5.00	65.92	Do.
Lowell	4.66	4.31	6.52	3.78	3.89	2.81	3.06	4.86	7.97	6.78	5.98	5.31	59.93	Do.
Ludlow	3.49	4.65	7.65	3.11	4.76	3.88	2.85	4.16	9.34	5.65	5.08	5.10	59.72	Do.
Lynn	3.87	3.02	5.88	2.72	5.87	2.09	2.54	6.18	8.85	5.40	8.13	5.46	60.01	Do.
Mansfield	4.21	3.78	6.86	2.51	5.19	2.23	2.60	7.00	9.80	5.41	10.18	5.44	65.21	Do.
Medford	3.69	3.25	2.82	4.96	....	4.36	2.26	6.72	7.79	4.73	6.30	4.94	....	Do.
Middleborough	3.80	3.59	5.63	2.11	5.01	1.78	3.88	5.56	9.44	3.56	10.23	4.14	58.73	Do.
Milton	3.15	2.66	6.13	1.86	4.00	1.46	1.23	6.14	8.70	4.24	9.51	5.18	54.26	Rev. A. K. Teele.
Monson	3.58	4.49	7.01	2.16	3.69	....	4.07	4.00	7.44	4.95	5.25	6.21	....	New England Meteorological Society.
Mount Nonotuck	4.46	4.87	6.98	3.02	4.76	4.61	3.16	4.81	10.18	5.13	4.76	4.70	61.44	Do.
Mystic Lake	3.35	3.50	5.37	2.80	5.34	2.11	2.31	6.49	8.83	5.04	7.02	5.42	57.58	Do.
Mystic Station	3.65	3.50	4.95	2.67	5.10	2.20	2.27	7.24	8.33	4.87	6.47	5.26	56.51	Do.
Nahant	....	....	....	....	....	2.68	2.29	7.48	6.48	....	....	....	....	William D. Hodges.
Nantucket (1)	3.48	1.50	3.14	1.43	7.87	1.51	3.68	0.87	7.30	4.99	6.49	3.45	45.71	Signal Service.
Nantucket (2)	5.24	2.27	4.23	2.26	8.12	2.05	3.14	0.83	7.66	4.99	6.49	3.45	50.73	New England Meterological Society.
New Bedford (1)	4.21	2.62	5.60	2.43	5.57	1.46	5.28	4.87	9.51	2.66	7.22	3.15	54.58	Thomas R. Rodman.
New Bedford (2)	5.04	2.97	5.78	2.77	5.95	1.00	4.67	5.02	11.56	3.07	7.24	3.50	58.57	New England Meteorological Society.
Newburyport (1)	5.13	4.65	6.25	3.54	5.58	1.59	2.54	5.35	8.47	5.66	6.74	2.95	58.45	T. V. Pike.
Newburyport (2)	2.39	4.57	4.17	3.73	4.82	1.64	2.54	5.37	8.00	5.35	5.51	2.95	51.04	New England Meteorological Society.
Newburyport (3)	2.82	3.15	6.25	3.54	5.58	1.59	2.54	5.35	8.47	5.66	6.74	4.76	56.45	Do.
Newton	6.16	....	....	....	....	....	....	....	....	....	....	....	....	Do.
Northampton	4.68	4.96	7.43	4.07	5.37	6.69	2.78	5.11	13.43	5.95	5.41	4.59	70.47	Do.
Plymouth	3.87	3.47	4.91	2.06	....	0.67	3.34	5.14	6.67	3.49	7.86	3.93	....	Do.

Monthly and annual precipitation (in inches and hundredths) for 1888, etc.—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Massachusetts—Continued.														
Princeton	....	....	....	2.87	....	3.39	2.62	5.14	6.38	5.67	6.22	5.52	....	New England Meteorological Society.
Provincetown	4.29	2.74	3.61	1.86	3.94	1.60	2.12	3.62	7.00	3.98	4.45	3.08	42.29	John R. Smith.
Rowe	2.20	4.95	7.00	3.70	4.00	3.27	2.05	6.50	6.25	5.50	6.30	4.35	56.07	New England Meteorological Society.
Salem	3.70	2.70	5.17	3.23	5.10	1.73	1.96	5.89	7.97	4.94	6.63	5.50	54.52	Do.
Somerset	3.38	2.87	6.49	2.17	5.15	1.66	3.80	5.35	7.27	3.09	8.15	4.13	53.51	Elisha Slade.
South Hingham	3.71	3.71	5.42	2.23	5.74	1.45	1.59	6.38	9.21	4.68	9.64	5.38	57.14	New England Meteorological Society.
Springfield	4.22	4.07	6.48	2.49	4.28	5.97	3.06	4.03	9.00	5.50	4.08	4.84	58.02	Do.
Swampscott	....	....	....	....	....	....	2.28	6.88	7.95	....	....	....	....	Do.
Taunton (1)	3.52	3.08	4.12	2.35	....	....	3.17	4.04	8.79	4.69	9.25	3.97	....	Dr. E. U. Jones.
Taunton (2)	4.67	3.25	6.74	2.35	4.95	1.63	3.40	5.09	9.11	4.90	9.55	4.48	60.12	New England Meteorological Society.
Taunton (3)	3.82	8.79	6.37	2.24	4.72	1.61	....	5.03	9.14	4.79	9.25	3.86	....	Do.
Vineyard Haven	3.05	3.30	5.41	0.91	4.25	1.69	4.51	1.02	11.39	5.40	3.39	2.54	46.86	Signal Service.
Waltham	4.22	3.04	5.17	....	5.20	2.14	1.68	6.22	8.50	4.65	9.16	5.72	....	New England Meteorological Society.
Wellesley	4.41	3.72	6.41	2.96	3.39	1.06	4.17	6.72	9.15	4.08	7.72	6.83	61.22	Do.
Westborough	3.32	3.66	5.77	2.27	5.15	2.27	0.97	5.93	8.18	4.69	6.31	5.15	52.67	G. S. Newcomb.
Williamstown	....	2.18	7.89	2.80	3.64	3.90	1.23	4.48	4.21	5.06	4.12	3.38	....	Williams College Observatory.
Winchester	4.34	3.42	5.00	2.88	4.85	2.11	2.11	5.97	8.29	4.87	6.68	5.12	55.64	New England Meteorological Society.
Wood's Holl	3.66	1.79	4.63	1.69	5.59	1.35	5.03	1.36	11.27	3.61	6.22	3.25	49.45	Signal Service.
Worcester	4.03	3.21	8.37	3.23	5.46	2.92	1.66	5.40	7.56	8.17	6.72	4.98	61.71	J. B. Hall.
Michigan:														
Adrian	1.65	2.20	2.98	3.31	2.70	5.20	3.88	1.55	1.19	1.64	2.87	1.53	30.70	State weather service.
Albion	....	....	....	....	....	....	....	....	2.21	1.84	2.08	1.71	....	Do.
Alma	2.56	1.73	3.10	1.87	3.92	1.87	0.94	1.51	2.22	2.00	3.73	1.61	27.06	Do.
Alpena	1.84	1.97	2.24	2.82	3.03	3.06	1.56	3.33	2.41	2.90	2.13	2.07	29.36	Signal Service.
Atlantic	....	....	....	....	....	....	....	3.48	2.27	2.18	0.82	....	....	State weather service.
Bad Axe	1.17	1.48	2.94	2.40	2.58	1.99	0.50	4.07	....	....	....	....	....	Do.
Battle Creek	....	....	....	....	....	1.32	0.67	0.60	....	....	....	....	....	Do.
Bear Lake	4.23	2.41	3.12	2.38	3.28	0.93	1.55	3.55	5.54	2.37	1.89	2.97	34.22	Do.
Bell Branch	....	1.40	2.12	0.91	2.09	3.08	2.98	0.92	....	2.25	2.65	1.16	....	Do.
Benton Habor	2.00	1.71	3.06	1.44	4.09	3.49	3.48	1.12	1.84	....	3.02	2.66	....	A. J. McClave.
Benzonia	5.07	2.78	4.54	2.63	4.40	0.47	2.60	3.59	5.64	2.37	2.14	2.43	38.66	State weather service.
Berlin	....	....	....	....	....	....	2.71	1.72	1.62	2.40	3.20	1.23	....	Do.
Big Rapids	1.88	2.00	3.50	2.06	2.89	1.55	1.27	7.37	2.86	1.80	2.80	2.21	32.19	Do.

Birmingham	1.65	1.41	2.92	1.73	3.70	4.10	2.04	1.02	1.19	2.54	3.42	1.58	27.30	S. Alexander.
Brady, Fort	1.98	1.26	1.93	1.60	3.22	1.93	0.93	3.30	3.56	2.32	3.31	2.84	27.68	U. S. post hospital.
Bronson	....	....	....	1.97	4.50	3.58	1.39	0.45	1.59	1.92	2.12	1.43	....	State weather service.
Buchanan	4.23	2.71	3.79	1.92	5.48	4.11	1.57	0.82	1.61	2.16	2.86	3.29	34.55	Do.
Calumet	....	1.35	1.34	1.22	1.93	5.03	0.87	2.03	1.84	3.48	2.17	0.58	....	Do.
Cassopolis	2.64	2.71	2.44	1.93	5.55	4.64	1.86	0.10	2.41	2.32	2.65	2.28	31.53	Do.
Central Mine	4.18	2.60	....	....	....	4.64	....	....	....	....	....	....	....	Do.
Charlevoix	2.75	....	....	....	3.11	0.45	2.35	1.95	5.71	....	....	....	....	Do.
Chase	2.58	1.92	4.22	1.07	3.06	1.51	3.18	6.00	2.91	....	1.24	0.75	....	Do.
Chelsea	4.75	1.24	2.60	1.34	3.62	1.95	0.78	....	....	....	....	....	....	Do.
Coldwater	1.80	....	2.2[illegible]	1.48	4.43	4.24	0.91	0.89	2.92	2.27	....	....	....	Do.
Colon	1.94	1.89	2.34	1.52	6.15	3.42	2.57	0.38	1.82	2.08	2.37	1.81	28.29	Do.
Columbia	....	....	....	....	....	....	1.69	1.69	1.13	....	....	1.65	....	Do.
Concord	1.85	1.46	1.68	0.93	4.10	3.09	0.76	....	2.73	2.22	2.51	1.24	....	Do.
Corunna	1.52	3.54	4.30	2.35	2.66	3.06	1.92	1.12	1.55	1.39	5.80	1.52	30.73	Do.
Deer Lake	....	....	....	....	....	....	....	4.02	3.31	2.43	2.32	2.14	....	Do.
Detroit	1.58	1.58	2.76	1.44	1.94	3.41	3.48	5.27	1.26	2.09	3.05	1.16	29.02	Signal Service.
East Saginaw	....	....	....	....	....	....	....	....	2.22	2.10	3.13	0.92	....	State weather service.
East Tawas	3.66	3.83	2.41	1.40	2.14	0.57	....	....	....	....	....	....	....	Do.
Eden	1.18	1.62	1.82	1.28	3.98	2.13	1.23	1.84	2.92	1.99	2.07	1.05	23.11	Do.
Escanaba	1.76	1.45	2.55	2.80	3.53	0.89	1.96	1.87	3.98	2.01	0.86	2.23	25.89	Signal Service.
Evart	....	....	....	....	....	....	....	1.40	0.23	2.71	1.10	....	....	State weather service.
Fletcher	2.42	0.60	2.56	....	1.69	2.21	1.26	3.13	2.80	3.20	1.81	1.83	....	Do.
Fremont	....	....	....	....	2.73	....	....	4.46	....	1.51	2.29	2.89	....	Do.
Gaylord	....	....	....	1.12	....	2.41	1.16	3.13	3.15	....	2.21	....	....	Do.
Grand Haven	2.20	1.45	2.40	1.54	3.01	1.48	1.59	2.59	2.58	2.00	3.06	2.06	25.96	Signal Service.
Grand Rapids	3.57	2.18	....	....	....	....	....	1.43	2.07	0.73	....	2.48	....	State weather service.
Greenville	4.25	2.54	3.32	....	....	....	....	....	....	....	....	....	....	Do.
Gulliver Lake	....	....	....	....	....	....	....	....	....	3.84	3.21	2.67	....	Do.
Hanover	1.67	1.50	1.96	1.35	2.83	2.72	1.92	2.06	2.19	2.60	3.01	1.49	25.30	Do.
Harrisville	1.78	2.10	2.59	1.83	2.40	0.74	1.37	5.57	3.04	3.42	3.13	1.70	29.67	Dr. D. W. Mitchell.
Hart	3.80	2.22	3.38	3.66	2.67	0.87	2.85	4.30	6.00	1.15	2.25	3.05	36.20	State weather service.
Hartford	1.20	2.10	2.60	1.48	5.04	2.47	....	....	....	....	....	....	....	Do.
Hastings	3.29	1.69	2.68	1.19	5.81	3.54	1.43	1.00	2.78	3.02	....	1.75	....	Do.
Highland	1.30	1.25	....	....	....	....	....	....	0.66	2.84	2.57	1.14	....	Do.
Hillman	1.30	1.57	2.50	2.85	3.29	2.29	1.20	3.43	1.91	....	1.41	1.40	....	Do.
Hudson	2.01	2.57	1.46	1.44	2.60	3.99	1.90	3.03	0.99	2.18	2.64	3.75	28.56	Maj. A. H. Boies.
Ionia	....	....	....	....	4.26	2.61	1.41	3.49	1.80	2.09	3.02	1.50	....	State weather service.
Jonesville	2.64	2.74	2.52	2.64	3.55	....	....	....	....	....	....	....	....	Do.
Kalamazoo	1.89	1.50	2.22	1.07	4.92	4.14	0.00	0.63	2.40	2.46	2.49	1.94	25.66	W. A. Black.
Lansing (1)	2.43	1.92	2.01	1.45	3.95	2.43	2.00	1.68	1.91	2.97	3.01	1.31	27.07	Signal Service.
Lansing (2)	1.69	1.74	2.02	1.29	3.65	2.07	1.80	1.83	2.06	3.03	3.33	1.25	25.76	Dr. H. B. Baker.
Lathrop	....	1.96	3.51	5.49	3.96	1.05	1.53	1.96	5.08	2.30	0.95	3.73	....	State weather service.
Madison	1.67	1.89	3.05	1.89	2.13	3.78	3.50	1.19	0.65	1.83	3.14	2.05	26.77	Do.
Manistee	....	....	....	....	....	....	4.20	4.62	4.98	2.39	2.90	3.15	....	Signal Service.
Maple Hill	2.18	1.51	3.98	2.03	2.80	1.61	1.79	....	....	....	....	....	....	State weather service.
Marshall (1)	2.06	1.15	2.43	1.60	5.99	4.80	0.93	1.18	2.57	2.37	2.71	1.93	29.72	G. H. Greener, M. D.
Marshall (2)	1.52	....	....	....	....	....	....	....	....	....	....	....	....	W. T. Drake.
Marquette	2.00	1.16	2.80	5.07	3.27	1.54	1.32	4.17	5.41	2.40	2.07	4.25	35.46	Signal Service.
May	3.48	1.91	2.35	1.29	2.94	1.61	2.02	2.39	1.04	2.49	3.31	1.08	25.91	State weather service.
Mio	1.93	1.66	2.90	2.67	2.14	1.26	1.66	2.95	2.03	1.92	2.85	2.10	26.07	Do.
Montague	....	....	....	....	....	....	....	....	....	2.04	1.05	2.68	....	Do.

Monthly and annual precipitation (in inches and hundredths) for 1888, *etc.*—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Michigan—Continued.														
Mottville	1.51	1.68	1.90	2.43	5.11	3.76	2.16	0.51	2.30	1.97	2.57	1.57	27.47	J. A. Hartzler.
Mount Morris	1.54	1.71	2.57	1.63	3.42	3.31	1.90							State weather service.
Mount Pleasant							1.04	0.99	1.27					Do.
North Marshall			1.89	1.52			0.59							Do.
Olivet	2.06	1.59	2.31	1.43	5.50	1.93				2.63	2.54	1.50		Do.
Omer		3.71	3.86	2.90	4.16	1.54	0.79	1.91	1.14			1.07		Do.
Ovid	2.09	1.77	2.03	1.64	4.22	2.51		0.31	2.22	2.13	2.92	1.30		Do.
Paw Paw	2.40	1.73	2.56	1.39										Do.
Petersburg	3.21	1.85	4.66	3.21	2.72	3.22	2.62	2.12	1.69	1.98	3.77	2.50	33.55	Do.
Pontiac	2.03	1.46	2.36	1.36	3.42	4.98	2.13	2.17	1.16	3.14	2.77	1.08	28.06	Do.
Port Huron	1.46	1.78	2.24	1.25	2.40	2.45	3.24	0.99	1.89	2.52	2.63	1.48	24.33	Signal Service.
Pulaski	1.81	1.51	2.01	1.47	3.09	3.21	2.04	1.69	1.92	2.49	2.72	1.28	25.24	State weather service.
Romeo		1.53	1.67	2.03	3.82									Do.
St. John's	1.52	1.53	2.14	1.86	4.77	3.38	1.28	2.55	1.88	2.34	3.02	1.23	27.50	Do.
St. Louis	2.10	1.63	3.11	1.78	3.64	1.54	0.92					1.17		Do.
Sand Beach	0.48	0.50				1.62	1.30	3.44	0.76	2.20	3.15			Do.
Sault de Ste. Marie	2.00	4.56	6.10	2.60	4.25	2.00	1.09	3.58	3.99	2.37	3.60	2.27	38.41	Signal Service and State weather service.
Snowflake	3.76	1.66	3.73											State weather service.
Thornville	1.26	0.83	2.12	1.57	2.78	3.81	2.31	1.81	1.52	2.79	3.11	1.65	25.56	John S. Caulkins.
Traverse City (1)	3.97	1.77	4.33	3.26	3.97	1.66	2.50	2.23	6.14	2.03	2.73	2.59	37.18	S. E. Wait.
Traverse City (2)						1.60	1.79	3.60	5.76	2.48		2.56		State weather service.
West Branch	2.58	1.65	4.20	1.60	1.80	1.10	6.57	2.70	2.85		3.30	2.03		Do.
Williamstown	1.43	2.42	1.25	1.23	3.87	2.60	2.30		3.07	3.25	3.65	1.19		Do.
Ypsilanti							2.04	2.66	0.91	2.52	3.78	1.50		J. C. Bemiss.
Minnesota:														
Alexandria	0.72	0.37	0.60	1.78	3.86						0.35	0.10		State weather service.
Argyle			[a]0.61	[a]1.26	0.95	5.24	4.48		1.35	1.80				Do.
Delano	3.06		3.01		5.49	1.73	5.76		1.82	0.99		0.41		Do.
Duluth	1.53	0.24	0.81	1.97	4.12	5.54	3.86	4.17	2.27	1.68	0.87	0.25	27.31	Signal Service.
Farmington			1.50	2.60	4.87	3.30	4.95	3.75	2.80		0.21	1.20		State weather service.
Glenwood	0.29	0.14	0.60	[a]2.41	4.47	5.21								Do.
Grand Meadow	1.47		2.68	[d]2.99	6.68	3.15	4.83	4.52	1.38	0.42	0.29	0.87		Do.
LakeWinnibigoshishDam		0.26	1.45		2.22		4.07	1.04	2.01	1.89	0.77	0.17		Do.
Leech Lake Dam		0.28	1.67		2.66		5.63	0.94	1.48	2.37	0.70	0.22		Do.
Le Sueur	[c]0.80	[d]0.70	[d]1.55		[d]2.75	[d]1.94	6.05	1.56	3.00	0.96	0.14	*0.18		L. B. Davis.
Mankato	0.99	0.91	1.89	5.19	6.87	1.90	1.94	3.67	1.37	1.49	0.20	0.84	27.26	State weather service.
Medford					7.53	3.14	2.56	2.34	1.24	1.39	0.15	0.83		Do.
Minneapolis	1.26	1.11	2.46	5.12	6.21	2.50	5.56	2.27	1.58	0.99	0.45	0.61	30.12	William Cheney.

Moorhead	1.09	0.42	1.04	1.43	2.20	2.98	3.48	0.92	0.55	2.22	0.08	0.09	16.50	Signal Service.
Morris	0.12	0.11	0.35	1.89	3.08	1.60	6.53	2.45	1.82	0.91	0.07	0.16	19.09	State weather service.
Northfield	1.03	0.80	0.41	3.09	5.45	*1.32	3.74	2.22	0.84	1.46	0.28	0.51	21.15	Do.
Pine River Dam	1.14	0.25	1.51	2.81	2.52	8.30	3.45	1.76	1.86	1.96	2.37	0.25	28.18	Do.
Pokegama Falls	1.13	0.45	1.93	2.17	2.75		3.97	0.76	1.56	1.68	1.16	0.48		Do.
Red Wing	1.45	0.91	3.35	4.92	7.53	3.01	3.30	3.34	1.32	1.63	0.24	0.98	31.98	Do.
Rochester		0.45	4.02	3.65	[b]7.42		2.52	2.19	1.20		0.27			Do.
Rolling Green	1.60	0.50	2.00	4.92	8.50	1.87	4.05	2.69	1.50	0.57	0.04	1.30	29.54	Do.
St. Paul	0.72	0.64	1.11	5.14	4.75	1.95	5.55	2.23	1.70	1.10	0.34	0.63	25.86	Signal Service.
St. Vincent	0.71	0.22	0.93	1.06	0.28	7.37	2.76	0.52	1.22	1.32	0.30	0.53	17.22	Do.
Snelling, Fort	0.81	1.84	1.72	6.79	4.76	2.57	5.90	3.04	1.70	1.00	0.10	0.65	30.88	U. S. post hospital.
Spring Valley	1.16	0.55	1.59	[g]3.82	6.18	4.47	5.13	3.55						State weather service.
Tracy	0.65	0.30	1.08	2.94	5.99									Do.
Wabasha	1.25	0.60	2.15	2.80	8.25	2.05	2.55	2.30	1.15					Signal Service.
Mississippi:														
Aberdeen				1.19	1.45	3.45	6.60	11.71	4.83	4.05				Signal Service.
Artonish	2.55	3.63	7.42	0.72	6.96	6.66	0.83	5.42	0.87	3.04	1.73	2.28	41.61	State weather service.
Batesville	3.46	3.14	9.68	2.13	3.57	4.37	0.87	9.66	6.09	2.18		3.71		Signal Service and State weather service.
Biloxi	3.03	8.90	7.25	1.78	9.58	6.11	2.74	1.91	4.64	4.85	2.22	[j]1.65	54.66	Dr. R. G. Hinsdale.
Brookhaven				0.12	3.16	2.74	1.46	9.75	3.54	3.08				Signal Service.
Canton	4.18	5.75	9.15	0.74	3.32	5.89			3.13	2.04	3.68	3.77		State weather service.
Columbus (1)	5.69	5.15	12.25	2.52	2.50	3.28	6.20	4.44	3.23					Do.
Columbus (2)				2.50	2.50	4.08	8.04	6.96	3.74	2.98				Signal Service.
Corinth				•T	[k]0.09	•1.36	1.41	5.53	1.46	•2.98				Do.
Edwards	3.81		7.37	2.81	2.59	4.39	3.46	6.76	2.98	3.40				Signal Service and State weather service.
Greenville	6,11		9.88	[a]1.65	[b]4.54	3.95	[a]3.28	[b]10.39						State weather service.
Hazlehurst				0.19	0.23	0.35	0.00	3.45	0.87	0.25				Signal Service.
Hermanville	7.25	5.35	7.15		2.60									State weather service.
Hernando				1.18	2.50	5.85	2.90	10.50	3.10					Signal Service.
Holly Springs				1.40	2.00	6.00	1.10	[c]14.11	4.10	2.10				Do.
Jackson (1)					1.90	[e]0.36	0.42	[e]4.07	[j]0.09	[e]0.90				Do.
Jackson (2)		4.00	8.70	0.54	4.06	3.04	5.21	8.63	0.70					W. J. Brown, jr.
Lake				0.10	3.84	3.99	1.75	7.30	1.78	5.65				Signal Service.
Long Beach			6.20	[f]0.53	[b]6.80									State weather service.
Macon				1.80	1.68	1.65	4.48	1.58	2.89	0.82				Signal Service.
Meridian				2.16	4.00	6.10	2.30	6.30	[f]1.10	3.80				Do.
Natchez				1.61	5.58	4.44	4.57	14.03	3.85	3.09				Do.
Okalona				1.67	1.75	1.40	4.86	4.45	3.95	2.75				Do.
Oxford				1.69	3.09	3.73	3.37	7.74	4.47	1.60				Do.
Palo Alto	4.82	4.49	10.61	1.53	2.03	4.82	6.60	5.82	6.25	3.20	3.31	3.00	56.48	William H. Hill.
Port Gibson				0.54	1.67	1.61	0.73	8.45	1.14	2.02				Signal Service.
Starkville	6.48	6.86	11.15	1.50	2.15		4.67	6.70		2.99	3.60	3.75		State weather service.
University	2.95	2.87	8.06	1.69	3.09	3.73	3.37	7.74	4.47	1.60	4.51	2.91	46.99	Signal Service,
Utica			6.44	1.62	2.43									State weather service.
Vicksburg	3.26	4.96	7.92	2.44	3.55	2.18	3.04	11.10	1.32	2.97	2.19	3.54	48.47	Signal Service.
Water Valley	3.50	3.47	11.60	1.27	2.80	3.74	2.44	9.73	6.71	2.22	1.58	2.49	51.55	State weather service.
Waynesboro				0.28	4.70	3.41	3.14	10.56	3.84	3.37				Signal Service.
West Point	1.13	5.74	12.22	1.60	2.74	1.71	5.27	7.02						State weather service.
Yazoo City	5.12	4.20	7.01	1.42	4.30	9.53	4.50	8.39	2.72	2.67	1.50	3.87	55.23	Signal Service.

* Incomplete.

Monthly and annual precipitation (in inches and hundredths) for 1888, *etc.*—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Missouri:														
Arlington	2.47	2.54	2.77	1.87	4.02		1.16	8.62	0.88	3.60	4.70	2.00		State weather service.
Boonville	2.51	5.57	6.87	1.53	5.72	7.78	4.18	5.27	0.46					Signal Service.
Carthage	2.34		2.93	3.91	5.44	5.18		7.95		3.49	4.28	3.70		State weather service.
Conception	1.02	2.50	1.82	1.61	6.94	4.70	2.04	9.82	0.45	0.88	2.22	0.85	34.85	Do.
Craig	0.31	3.00		1.85	5.35	8.60	4.15							Do.
Fayette	2.42	2.23	6.10	1.32	4.20	4.74	4.05	6.96	1.76	2.59	2.65	2.10	41.12	Prof. T. Berry Smith.
Fox Creek	2.37	2.33	2.94	1.47	3.66	5.60	2.27	4.13	1.19	3.76	3.31	2.54	35.57	State weather service.
Frankford	1.25	2.18	3.64	1.26	5.92	7.00	4.82	4.42	0.76	0.57	3.16	2.21	37.19	W. W. Vermillion.
Glasgow		2.98	4.80	1.14	5.21	5.71	4.42	6.45	2.59	2.17	2.59	2.12		State weather service.
Harrisonville	1.83	1.28	6.67	2.70	1.76	4.35	1.48		0.60	2.82	2.66	2.63		Do.
Hermann	1.93	1.62	5.87	1.61	3.71	8.14	5.63	5.12	0.94	2.91	3.52	2.46	43.46	Do.
Ironton	2.65	2.50	2.50	1.15	3.85	4.40	3.95	8.25	1.45	2.40	4.80	2.95	40.85	Do.
Jerome	2.47	2.54	2.77	1.87	4.02	3.39	1.16	12.13	0.88					Signal Service.
Kansas City (1)							4.53	9.18	0.26	4.49	2.98	0.79		Do.
Kansas City (2)	1.75	1 74	5.78	3.00	4.66	8.74	4.75	9.32	0.24	3.75	3.08	2.00	48.81	State weather service.
Kansas City (3)	1.54	1.65	5.39	2.83	5.28	8.15	2.67	9.15	0.11	1.05	1.75	0.35	39.92	Do.
Kidder		1.90												Do.
Kirksville	1.60	0.71	2.55	1.25	5.26	4.27	10.48	2.67	2.32		1.86	1.15		Do.
Lamar	2.18	1.94	2.36	3.27	5.63	5.08	1.17	8.75	0.67	3.63	2.50	5.73	42.91	Signal service.
Lamonte							1.44	7.65		2.33	2.95	3.09		State weather service.
Louisiana (1)	2.37	3.16		0.95	5.77	6.35								Do.
Louisiana (2)	1.76	1.37	3.09	0.69	5.10	5.64	2.34	5.05	1.94					Signal service.
Maryvillle	0.65	1.20	2.30	2.00	10.50						2.00	0.70		State weather service.
Mexico	2.19	1.65	4.79	0.89	5.18	6.10	3.29	7.62	1.91	1.57	2.95	2.81	40.95	Do.
Miami	2.18	2.30	6.00	1.58	6.04	10.52	4.45	9.50	0.71					Do.
Oakwood								7.32			3.22	2.35		Do.
Oregon	1.33	2.26	4.08	1.95		3.51	5.76	5.91	1.24	2.03	2.75	1.54		Do.
Ozark	0.60	0.61	2.66	0.80	5.45	4.70		8.80	1.60	2.50	4.65	2.50		Do.
Pierce City	3.60	2.00	3.30	2.70	4.60	8.70	0.80	11.90	0.20	4.00	4.20	2.70	48.70	J. J. Spilman.
Princeton	2.76	1.12	3.21	1.07	9.19	6.90	5.98	5.40	2.00	1.05	2.60	3.35	44.63	William Hirons.
St. Charles (1)	1.42	2.04	3.66	0.98	4.70	6.96	1.79	4.51	0.61	2.66	3.11	2.20	34.64	State weather service.
St. Charles (2)	2.10	3.10	3.25	1.05	4.30	6.40	1.80	3.90	0.20	1.50	2.50	2.80	32.90	Do.
St. Joseph	0.18	1.85	2.55	1.32	4.94	6.49	3.85	1.50	0.55					Signal Service.
St. Louis (1)	2.15	2.39	3.79	1.88	3.81	8.09	2.09	6.66	1.31	2.59	4.40	2.01	41.17	Do.
St. Louis (2)	2.43	2.40	4.08	1.85	3.44	7.42	2.07		0.73	2.56	4.45			State weather service.
St. Louis (3)	0.85	2.12	3.06	1.50	3.47	7.59	1.99		1.00	0.78	3.65			Do.
St. Louis (4)	2.66	2.91	5.15	1.93	4.32	8.95	2.09	7.61	2.32	3.86	6.54	2.94	51.28	Do.
Savannah	0.80	1.55		1.45	11.50	4.45	5.05	9.65	0.30		2.60	1.57		Do.
Sedalia	3.20	2.56	7.67	1.33	4.01	4.69	1.65	5.83		3.22	2.28	2.50		Do.

Shelbina	2.51	2.90	4.21	1.21	6.50	6.70	....	5.00	1.50	1.80	2.80	....	....	Do.
Springfield (1)	2.13	1.82	2.97	1.45	7.42	4.45	....	8.70	1.95	....	....	....	....	Do.
Springfield (2)	1.42	1.22	2.46	1.82	7.36	6.11	0.50	7.97	1.89	5.07	3.78	2.52	42.12	Signal Service.
Steelville	2.40	2.05	1.76	2.75	3.20	4.79	2.33	10.40	0.40	2.53	3.70	1.80	38.11	State weather service
Warrensburgh	1.40	2.01	6.76	2.20	1.38	....	....	8.81	....	2.34	....	1.83	....	Do.
Westport	....	....	....	....	....	6.98	1.26	0.25	....	....	....	....	....	Do.
Montana:														
Assiniboine, Fort (1)	0.46	1.47	0.95	0.50	2.04	4.49	0.51	2.16	0.41	0.34	0.06	0.60	13.99	Signal Service.
Assiniboine Fort (2)	....	....	....	....	....	....	....	....	0.41	0.34	0.06	0.60	....	U. S. post hospital.
Custer, Fort (1)	0.39	0.57	0.35	0.63	2.28	4.91	1.20	1.93	0.50	0.66	0.40	0.16	13.98	Signal Service.
Custer, Fort (2)	....	....	....	....	....	....	....	....	0.50	0.66	0.40	0.16	....	U. S. post hospital.
Helena	0.79	0.12	1.32	0.56	2.96	1.87	0.89	0.26	0.14	0.14	0.32	0.77	10.14	Signal Service.
Keogh, Fort	1.04	1.43	0.31	0.15	1.35	4.29	1.02	2.60	T	0.27	0.23	0.30	12.99	U. S. post hospital.
Maginnis, Fort	2.77	3.37	3.21	1.57	3.21	7.31	0.88	1.49	0.15	0.93	0.03	0.78	25.70	Signal Service.
Missoula, Fort	....	0.22	0.20	....	0.20	3.38	....	....	0.33	0.28	0.03	0.28	....	U. S. post hospital.
Poplar River	0.48	0.60	0.41	0.78	0.77	4.94	2.19	1.40	0.61	0.88	0.11	0.23	13.40	Signal Service.
Shaw, Fort	....	0.00	....	....	....	....	....	....	0.28	0.11	0.03	0.48	....	U. S. post hospital.
Virginia City	0.03	....	....	0.83	1.53	3.30	0.55	0.88	0.57	0.23	1.28	0.03	....	Eugene Stark.
Nebraska:														
Ashland	1.25	1.25	4.64	2.08	5.88	5.20	2.31	2.30	0.21	1.43	0.06	0.97	27.58	State weather service.
Brownville	0.60	1.30	2.59	....	....	....	....	....	....	....	....	....	....	G. D. Carrington.
Crete	0.35	0.61	4.63	2.31	5.01	4.02	2.15	1.67	0.13	2.03	0.17	0.26	23.34	Signal Service.
Culbertson	....	....	....	2.90	4.79	1.85	1.12	1.64	0.97	0.83	0.25	0.05	....	Do.
De Soto	0.95	0.64	4.77	3.93	4.99	3.34	5.37	5.58	0.64	1.00	0.13	1.72	33.06	Charles Seltz.
De Witt	1.00	....	1.50	1.50	5.50	....	....	....	....	....	....	....	....	State weather service.
Fairbury	....	0.50	3.25	1.85	4.40	6.91	2.78	3.98	0.25	2.04	0.15	0.29	....	Dr. I. Humphrey.
Falls City	0.92	1.92	2.96	1.97	6.58	4.22	2.78	5.45	0.55	1.71	1.93	0.79	31.78	A. B. Newkirk.
Franklin	0.16	0.45	1.67	1.28	4.00	....	....	....	....	....	....	....	....	State weather service.
Fremont (1)	1.00	0.35	2.00	1.97	4.64	3.26	3.38	4.59	0.39	0.91	0.08	0.93	23.50	Isaac E. Heaton.
Fremont (2)	1.00	2.50	2.00	1.97	4.64	3.26	....	....	....	....	....	....	....	Rev. L. F. Berry.
Genoa	0.23	0.64	2.25	3.58	5.06	4.49	7.14	4.49	0.29	0.68	0.20	0.25	29.30	George S. Truman.
Hay Springs	0.44	1.22	0.94	0.88	7.25	3.26	3.09	3.38	0.00	0.15	0.33	0.32	21.26	William Waterman.
Kimball	0.25	....	....	0.47	3.72	2.54	2.79	1.39	0.02	0.10	T	T	....	William G. Barton.
Lincoln	0.80	0.49	3.03	1.61	4.62	4.74	3.00	4.95	0.08	1.84	0.19	0.46	25.81	University of Nebraska.
Marquette	0.31	0.73	2.37	2.02	3.80	2.41	3.21	3.81	0.13	0.87	T	0.01	19.48	John Ellis.
Minden	0.20	0.78	3.91	8.00	5.76	7.75	....	4.12	....	1.55	0.10	0.17	....	State weather service.
Nebraska City	0.41	1.20	4.29	1.84	6.99	3.79	3.43	3.15	0.07	2.31	0.41	0.63	28.52	Do.
Niobrara, Fort	T	0.30	0.66	0.96	10.62	1.96	2.68	2.66	....	0.74	0.10	0.16	....	U. S. post hospital.
North Platte	0.09	0.42	1.44	2.36	4.93	2.76	2.61	0.65	0.58	1.12	0.08	0.42	17.46	Signal Service.
Omaha	0.58	0.74	3.25	2.95	4.36	3.86	2.56	3.44	0.24	1.16	0.12	0.96	24.22	Do.
Palmer	1.00	0.80	2.00	4.00	3.50	2.00	2.20	3.25	0.00	1.00	0.00	0.60	20.35	State weather service.
Plattsmouth	0.40	0.90	2.55	2.40	8.30	5.90	3.22	5.20	0.60	....	....	....	....	Signal Service.
Ravenna	....	0.79	3.46	3.53	4.55	2.01	5.28	4.22	0.48	1.31	0.09	0.60	....	State weather service.
Red Willow	0.48	1.28	0.72	2.88	6.48	2.68	1.04	1.88	1.04	1.12	0.28	0.12	20.00	Do.
Robinson, Fort	0.00	0.09	0.60	0.04	9.39	....	1.45	1.46	T	T	0.46	0.07	....	U. S. post hospital.
Sargent	....	....	....	2.31	8.30	3.02	5,63	....	1.62	0.83	0.00	1.35	....	State weather service.
Sidney, Fort	0.05	0.64	0.30	1.35	4.42	2.17	0.78	1.12	....	0.72	T	....	....	U. S. post hospital.
Syracuse	0.26	0.90	3.45	2.00	8.09	3.09	4.68	2.56	0.26	2.04	1.18	0.56	29.07	P. W. Risser.
Tecumseh	0.22	1.61	2.75	1.75	8.23	4.31	3.86	4.89	0.30	2.45	0.35	0.60	31.32	W. L. Dunlap.
Valentine	0.04	0.75	1.44	1.05	9.85	2.30	4.83	1.77	0.66	....	0.19	0.26	....	Signal Service.
Weeping Water	0.37	0.87	3.87	2.12	4.00	....	1.50	5.12	....	1.86	1.00	0.75	....	G. Treat.

Monthly and annual precipitation (in inches and hundredths) for 1888, etc.—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Nebraska—Continued.														
West Hill	2.30	....	....	....	....	....	4.68	3.55	0.10	0.85	0.10	0.21	....	State weather service.
West Point	1.87	....	....	3.23	3.55	2.75	2.92	8.95	0.20	1.20	0.30	0.60	....	Do.
Nevada:														
Austin	....	0.30	....	0.25	....	T	0.09	....	1.00	....	0.60	....	....	Do.
Battle Mountain	3.12	0.30	0.25	0.35	1.50	0.50	0.22	0.00	0.65	0.18	0.82	1.89	9.78	Pacific railway system.
Beowawe	1.10	0.10	0.00	0.15	0.35	0.59	0.00	0.00	0.00	0.35	0.08	0.47	3.19	Do.
Brown's	0.40	0.35	0.00	0.20	0.38	0.08	0.00	0.00	0.23	0.05	0.33	0.20	2.22	Do.
Burner's Ranche	....	....	0.88	2.95	1.54	0.47	0.35	....	....	0.70	4.20	6.00	....	State weather service.
Carlin	2.20	0.20	0.18	0.50	1.00	0.25	0.00	0.00	0.60	1.05	0.10	1.98	8.06	Pacific railway system.
Carson City (1)	1.51	0.17	0.50	0.18	1.11	0.07	0.25	0.02	0.53	T	1.75	0.56	6.65	Signal Service.
Carson City (2)	1.54	0.22	0.54	0.20	1.05	0.08	0.27	0.02	0.59	T	2.00	0.61	7.12	Charles W. Friend.
Cherry Creek	....	....	0.46	0.77	0.21	0.21	0.32	0.04	....	0.87	....	....	....	State weather service.
Crane's	....	....	0.81	1.24	0.67	0.64	0.33	....	0.13	0.58	0.96	1.16	....	Do.
Dayton	....	0.04	0.10	0.21	1.13	....	....	....	0.61	....	1.69	0.32	....	Do.
El Dorado	....	....	0.72	0.33	....	0.00	0.83	0.60	0.05	0.14	0.85	1.64	....	Do.
Elko (1)	1.08	0.20	0.64	0.80	1.21	0.00	0.70	....	0.25	....	....	1.35	....	Pacific railway system.
Elko (2)	....	0.54	0.52	0.85	....	0.06	0.98	....	....	....	0.51	0.34	....	State weather service.
Ely	....	1.42	2.08	0.69	0.37	0.16	1.13	0.47	0.92	....	0.90	....	....	Do.
Eureka	....	....	....	1.52	1.77	0.28	0.76	0.06	1.03	0.57	0.56	0.60	....	Do.
Fenelon	3.30	0.30	....	0.08	....	....	....	....	....	....	....	1.52	....	Pacific railway system.
Genoa	....	0.70	0.92	....	....	0.60	....	....	0.24	....	0.27	0.65	....	State weather service.
Golconda	0.70	0.10	0.00	0.95	1.25	0.45	....	0.00	0.05	0.65	0.25	1.05	....	Pacific railway system.
Halleck	0.85	0.25	0.40	0.88	0.67	0.70	0.30	....	0.20	0.80	0.67	0.55	....	Do.
Hawthorne	2.38	0.26	0.30	....	1.20	....	0.00	T	0.00	0.00	0.87	0.35	....	Do.
Hot Springs	0.60	0.20	0.05	0.05	0.21	0.00	0.10	0.00	0.30	0.17	0.25	0.34	2.27	Do.
Humboldt	0.60	T	0.00	0.25	0.20	0.00	0.00	0.00	0.42	0.00	0.24	1.36	3.07	Do.
Lovelock	....	....	....	0.42	0.97	T	0.00	....	....	....	....	....	....	State weather service.
McDermit, Fort	1.04	3.17	3.32	T	1.10	0.75	T	T	0.28	0.92	0.04	1.27	11.89	U. S. post hospital.
Mill City	....	0.46	0.26	0.26	0.81	0.42	....	0.52	0.50	....	....	0.85	....	State weather service.
Montello	....	....	0.60	0.60	....	....	....	....	....	....	0.63	0.50	....	Pacific railway system.
Palisade	0.85	0.15	0.10	0.19	0.32	0.62	0.00	0.00	0.05	0.30	0.37	1.94	4.89	Do.
Pioche	....	3.15	2.40	0.19	1.56	T	0.33	3.68	0.50	0.16	....	2.85	....	State weather service.
Pyramid	....	....	....	....	1.00	T	0.00	....	2.12	....	....	....	....	Do.
Reno (1)	1.30	0.00	0.80	0.00	0.38	0.00	0.55	0.15	0.00	0.00	0.99	0.43	4.60	Pacific railway system.
Reno (2)	....	T	0.57	0.14	0.38	0.11	0.44	....	0.70	....	1.95	....	....	State weather service.
Rioville	....	....	....	....	....	....	0.06	0.17	....	0.01	1.29	1.98	....	Do.
Rye	....	....	0.26	0.31	1.82	....	....	....	....	....	....	....	....	Do.
Secret Valley	....	....	1.90	2.40	0.91	1.90	....	....	....	....	....	....	....	Do.
Tecoma	1.18	0.40	0.40	0.20	0.15	0.25	1.03	0.00	0.50	0.80	0.70	0.70	6.31	Pacific railway system.

Toano	1.95	0.40	1.02	0.75	0.84	0.19	0.10	......	0.65	1.75	0.70	1.42	......	Do.
Tuscarora	......	......	......	......	......	......	......	......	0.76	0.71	0.67	3.27	......	State weather service.
Verdi	......	......	0.50	0.09	0.63	0.38	0.48	0.00	0.63	......	......	......	......	Do.
Wadsworth	0.90	0.00	0.00	0.10	0.52	0.00	T	......	......	......	......	......	......	Pacific railway system.
Wellington	......	......	......	0.15	0.58	0.26	0.81	0.27	......	......	1.66	0.60	......	State weather service.
Wells	1.75	0.10	0.00	0.00	......	......	0.00	......	0.50	0.65	0.30	0.72	......	Pacific railway system.
Winnemucca (1).	1.40	0.63	0.21	0.20	0.52	0.21	0.01	T	0.24	0.08	0.52	0.87	4.89	Signal Service.
Winnemucca (2)	1.37	0.63	0.15	0.20	0.50	0.26	0.00	0.00	......	0.03	0.00	0.10	......	Pacific railway system.
Winnemucca (3)	......	0.60	0.15	0.20	0.50	0.25	0.07	......	0.26	0.08	......	......	......	State weather service.
New Hampshire:														
Antrim	5.30	4.15	5.27	3.23	5.95	2.80	1.87	5.36	10.45	6.10	7.14	3.89	61.51	Frank W. Palmer.
Ashland	4.81	4.31	4.84	3.38	5.05	2.34	1.78	......	......	......	......	......	......	Lake Winnipiseogee Cotton and Woolen Manufacturing Co.
Belmont	5.26	4.18	6.35	2.86	3.48	1.83	0.91	2.90	8.96	5.71	4.52	2.67	49.63	Do.
Berlin Mills	3.64	1.80	4.19	1.99	1.46	1.51	2.18	2.75	3.77	3.86	6.04	2.81	36.00	Q. A. Bridges.
Bristol	4.07	4.43	5.04	3.64	4.39	2.06	1.47	4.57	8.06	5.62	5.61	2.66	51.62	Lake Winnipiseogee Cotton and Woolen Manufacturing Co.
Chesterfield	......	......	......	3.03	1.81	......	......	......	8.25	......	6.07	3.92	......	New England Meteorological Society.
Concord	4.93	3.69	4.92	2.84	4.48	2.57	0.96	3.67	10.97	5.63	4.15	3.52	52.33	W. L. Foster.
Grafton	4.57	3.76	4.96	......	......	......	......	......	......	......	......	......	......	New England Meteorological Society.
Hanover	3.75	2.20	5.25	2.39	3.28	4.65	1.99	6.55	5.86	4.05	5.14	2.37	47.48	Do.
Lake Village	5.46	4.39	6.01	3.15	3.83	2.38	1.61	4.04	9.82	5.71	6.69	3.01	55.60	Lake Winnipiseogee Cotton and Woolen Manufacturing Co.
Manchester (1)	3.76	3.76	4.41	2.60	4.05	1.73	1.63	4.20	8.58	5.47	3.66	2.96	46.81	Signal Service.
Manchester (2)	4.85	4.84	5.22	3.27	4.23	2.00	1.70	4.65	9.55	6.03	4.17	3.21	53.72	New England Meteorological Society.
Manchester (3)	4.78	4.98	5.36	3.27	......	......	1.74	4.72	9.62	6.19	4.53	3.57	......	Do.
Mine Falls	4.27	4.83	5.64	3.48	3.11	1.16	1.66	4.48	10.13	5.71	4.73	3.96	53.16	Do.
Mount Washington	......	......	......	......	......	......	6.58	15.31	9.48	......	......	......	......	Signal Service.
Nashua	4.21	4.17	5.06	3.25	2.64	1.67	1.63	4.02	9.54	6.35	4.37	3.94	50.85	Charles H. Webster.
North Conway	4.89	4.57	5.54	2.47	3.22	2.90	2.16	3.87	10.13	8.48	3.56	......	......	New England Meteorological Society.
Pennichuck	3.76	4.43	4.94	3.12	3.11	1.13	1.36	4.31	9.76	6.61	4.24	3.91	50.68	Do.
Plymouth	4.17	5.09	7.19	3.59	3.97	3.17	1.58	3.91	8.06	5.18	5.28	2.28	53.57	Do.
Shaker Village	......	......	......	......	......	......	......	......	......	4.14	2.72	2.30	......	Nicholas A. Briggs.
Shelburne	3.77	2.03	5.48	......	......	......	......	......	......	......	......	......	......	New England Meteorological Society.
Stratford	1.89	2.13	3.85	0.94	2.86	2.93	1.75	6.00	5.30	3.44	5.54	2.30	38.93	Do.
Walpole	4.37	3.87	5.46	3.42	2.58	5.43	3.23	9.50	......	9.92	5.54	2.88	......	Do.
West Milan	4.40	1.42	3.54	1.41	2.09	1.80	2.18	5.54	4.63	4.68	5.85	2.47	40.01	Do.
Wier's Bridge	4.32	4.31	2.79	3.39	4.44	2.07	1.13	4.11	9.31	5.66	5.68	2.34	49.55	Lake Winnipiseogee Cotton and Woolen Manufacturing Co.
Wolfboro	4.48	5.04	7.27	3.21	3.75	2.46	1.45	3.99	8.07	6.18	5.69	3.33	54.87	Do.
New Jersey:														
Atlantic City	3.96	2.81	4.15	2.96	4.02	3.33	2.44	4.30	7.14	3.48	2.71	2.84	44.14	Signal Service.
Beverly	4.69	2.55	5.15	1.89	3.16	3.08	4.61	6.14	4.10	4.00	4.15	3.02	46.54	Charles F. Richardson.
Bordentown	3.98	3.04	7.93	2.98	4.81	3.01	......	......	......	......	......	......	......	State weather service.
Bridgeton	......	......	......	2.27	4.07	1.67	2.39	5.49	3.75	5.15	2.71	......	......	Do.
Clayton	4.42	2.52	5.29	2.23	4.15	1.76	3.70	4.93	5.07	4.72	3.11	2.05	43.95	William T. Wilson.
Egg Harbor City	4.93	2.78	5.98	3.37	6.48	2.04	3.87	2.58	6.00	5.02	3.19	2.44	48.68	H. Y. Postma.

Monthly and annual precipitation (in inches and hundredths) for 1888, etc.—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
New Jersey—Continued.														
Freehold	4.94	2.99	6.40	3.70	6.18	....	3.20	4.03	8.20	2.97	3.87	3.08	....	State weather service.
Gillette	5.06	4.82	6.77	3.75	5.40	2.07	1.25	7.39	10.34	3.52	3.01	4.39	57.77	Do.
Hanover	5.61	4.51	4.43	3.77	5.15	4.73	4.00	6.51	8.23	4.32	3.31	4.53	59.10	Do.
Highland Park	....	....	....	....	....	3.78	3.08	5.58	8.66	5.58	4.37	3.97	....	Do.
Hopewell	....	....	....	....	....	2.15	3.21	....	8.85	....	5.06	3.70	....	Do.
Imlaystown	5.51	2.57	7.00	3.16	5.09	3.77	4.00	5.07	6.09	4.60	4.15	2.62	53.63	Do.
Lambertville	4.98	4.06	6.04	3.84	3.42	2.09	4.74	5.58	9.45	....	3.85	3.91	....	Do.
Locktown	5.06	3.86	4.27	4.43	3.00	2.47	2.40	7.77	7.73	....	3.33	4.11	....	Do.
Moorestown	4.44	2.11	5.39	2.02	3.16	2.67	7.03	6.25	5.30	4.14	4.04	2.69	49.24	Thomas J. Beans.
Newark	5.86	4.29	6.08	4.05	6.33	2.70	2.06	7.08	6.21	4.04	4.90	3.27	56.87	State weather service.
New Brunswick (1)	4.96	3.63	5.86	3 89	4.89	3.43	3.42	5.55	7.80	5.62	4.37	3.84	57.26	Do.
New Brunswick (2)	5.22	3.90	5.43	4.68	5.25	3.51	2.66	5.93	8.17	5.55	4.29	4.41	59.00	Do.
Ocean City	3.00	4.20	5.65	3.00	3.40	2.10	3.50	7.10	5.60	7.00	4.60	4.70	53.85	Do.
Oceanic	5.34	3.09	5.41	3.68	5.43	3.95	5.16	4.38	10.65	4.05	4.98	3.15	59.27	Do.
Paterson	6.74	3.31	4.39	3.32	6.08	2.73	....	8.43	6.61	4.10	2.66	....	....	Do.
Princeton	4.02	3.36	5.05	3,74	4.35	2.91	....	....	....	....	....	....	....	Do.
Rancocas	4.09	2.97	6.10	1.99	3.01	2.36	6.80	5.77	5.52	4.51	4.74	3.02	50.88	Do.
Somerville	....	4.11	6.87	4.31	4.30	3.30	2.77	6.91	7.65	4.01	3.19	4.14	....	Do.
South Orange	6.35	4.12	8.20	4.10	6.46	3.62	2.62	8.33	7.93	5.86	4.85	4.95	67.39	Dr. W. J. Chandler.
Tenafly	6.35	6.01	4.48	3.77	7.01	1.89	2.47	6.30	6.25	5.53	3.82	4.89	58.71	State weather service.
Tom's River	4.31	2.04	5.05	1.95	3.86	5.10	2.87	4.69	4.15	4.39	3.71	2.78	44.90	Do.
Trenton	5.08	4.14	8.22	2.24	5.54	5.69	5.82	6.87	7.60	5.50	5.41	4.13	66.24	Do.
Union	4.42	3.94	6.08	3.87	6.03	3.92	2.88	7.22	8.12	5.22	3.87	3.59	59.16	Do.
Vineland	4.46	2.52	7.41	2.00	5.48	1.19	3.54	3.96	3.28	5.06	3.51	1.27	43.68	Dr. O. H. Adams.
New Mexico:														
Bayard, Fort	0.15	0.29	0.90	....	0.10	0.20	4.79	0.27	0.30	3.00	2.05	1.02	....	U. S. post hospital.
Coolidge	....	....	....	....	....	....	1.60	0.80	0.40	0.90	0.40	0.90	....	B. S. Mullin.
Gallinas Spring	0.30	0.27	0.54	1.04	0.58	2.24	2.13	3.32	0.08	1.70	2.18	0.79	15.17	J. E. Whitmore.
Las Vegas	0.14	0.76	0.55	0.76	3.00	1.68	3.54	5.85	....	0.40	1.08	0.45	....	F. W. Chatfield.
Lava	0.02	1.75	0.70	0.45	0.09	0.38	2.12	1.34	0.55	3.10	4.85	0.31	15.66	Signal Service.
Lordsburgh	0.44	0.10	....	....	....	....	....	....	....	....	....	0.92	....	Pacific railway system.
Santa Fé	0.44	0.90	0.61	1.42	0.70	0.16	1.98	2.08	0.38	1.40	1.30	0.66	12.03	Signal Service.
Selden, Fort	0.16	1.15	0.82	0.54	0.00	0.00	*3.84	*2.29	*2.01	*7.55	*8.13	*1.44	*27.93	U. S. post hospital.
Stanton, Fort	0.22	1.09	2.82	1.69	0.25	0.88	1.60	4.51	1.16	2.14	1.53	0.15	18.04	Signal Service.
Union, Fort	3.10	0.09	2.05	2.16	0.70	2.58	4.36	8.28	0.18	0.82	0.92	0.30	25.54	U. S. post hospital.
Wingate, Fort	1.08	1.30	1.38	2.36	0.24	0.04	2.02	0.24	0.42	0.50	0.76	1.06	11.40	Do.
New York:														
Albany (1)	3.04	2.07	5.62	1.95	2.98	3.18	2.52	4.74	4.68	6.10	4.48	3.30	44.66	Signal Service.
Albany (2)	2.94	1.59	5.73	2.03	....	....	....	....	....	....	....	....	....	C. B. Tillinghast.
Ardenia	3.83	4.59	5.16	2.71	5.82	1.11	1.81	7.21	7.67	4.64	3.06	5.45	53.06	Richard B. Arden.

Auburn	2.37	1.63	3.18	4.11	4.29	7.02	2.74	3.73	2.27	4.56	4.60	3.94	44.39	George Casey.
Boyd's Corners	5.56	5.07	6.44	2.68	6.17	2.19	2.24	6.87	10.77	4.80	4.49	6.13	63.41	Thomas Manning.
Brooklyn	2.33	2.84	5.16	3.66	3.78	1.90	....	7.66	....	....	....	2.82	....	Prof. W. C. Peckham.
Buffalo	2.45	1.46	2.07	3.46	1.66	3.64	2.01	1.81	3.52	5.43	3.90	2.46	33.87	Signal Service.
Carmel	5.58	5.11	5.89	2.67	5.76	2.83	2.22	6.49	10.92	4.39	4.12	6.24	61.72	Thomas Manning.
Columbus, Fort	5.03	3.90	6.28	3.43	4.64	1.81	1.22	6.67	7.50	4.11	5.12	3.31	53.02	U. S. post hospital.
Cooperstown	2.47	1.58	3.34	3.05	2.76	4.32	1.52	4.95	3.97	4.09	3.09	3.30	38.44	G. Pomeroy Keese.
David's Island	....	....	....	....	....	....	....	....	....	3.39	3.00	2.82	....	U. S. post hospital.
Eden	....	....	....	....	2.32	3.25	1.82	4.44	4.24	3.40	4.96	5.73	....	W. P. Hunt.
Factoryville	2.51	0.86	2.14	2.02	2.08	1.17	2.12	3.44	3.71	3.15	2.70	3.01	28.91	F. P. Yates.
Friendship	1.10	1.12	2.58	9.85	0.21	3.15	1.41	4.73	1.02	4.10	1.52	3.25	34.04	Jesse D. Rogers.
Geneva	....	....	....	3.40	2.78	3.93	0.93	3.04	2.48	3.53	2.42	1.94	....	Mrs. N. S. Yates.
Humphrey	3.51	1.74	1.80	4.14	4.63	3.57	2.42	4.09	3.55	4.27	2.60	2.81	39.13	Charles E. Whitney.
Ithaca	1.11	0.83	1.97	2.15	2.38	2.37	2.33	3.36	2.64	4.48	3.93	3.42	30.97	Engineering department, Cornell University.
Le Roy	2.67	1.08	1.41	2.21	1.64	4.05	1.59	4.59	2.34	4.07	2.62	1.65	29.92	Prof. F. M. Comstock.
Lyons	....	....	....	....	1.69	4.98	1.69	3.91	2.34	3.68	3.15	2.27	....	Dr. M. A. Veeder.
Madison Barracks	†0.20	†0.58	†0.90	0.66	0.28	1.09	2.24	2.59	4.49	7.13	2.97	....	....	U. S. post hospital.
New York (1)	5.14	4.08	5.64	3.57	4.87	1.68	1.27	6.35	7.40	4.14	4.81	4.05	52.95	Signal Service.
New York (2)	4.96	3.49	4.62	2.89	5.62	2.60	1.53	7.66	8.16	4.33	4.04	3.42	53.32	Meteorological Observatory, Central Park.
Oswego	2.01	1.62	1.79	2.09	1.56	2.60	2.32	4.56	5.27	3.24	3.52	2.21	32.79	Signal Service.
Palermo	3.53	1.91	1.89	2.30	1.17	2.26	3.13	3.46	4.23	2.20	3.45	2.25	31.78	E. B. Bartlett.
Penn Yan	1.61	0.86	1.74	2.75	4.19	3.16	0.73	4.80	2.63	3.74	2.37	2.51	31.09	George R. Young.
Plattsburgh Barracks	0.59	0.20	1.95	1.27	3.20	1.88	1.12	5.23	3.76	2.98	3.90	2.36	28.44	U. S. post hospital.
Rochester	1.87	0.85	2.34	1.22	1.79	4.69	1.12	3.61	2.19	3.22	2.86	2.00	27.76	Signal Service.
Rose	....	....	1.64	2.87	2.50	4.88	1.88	4.91	3.50	4.17	3.74	2.05	....	George Smart.
Savona	....	....	....	....	....	....	1.60	3.02	2.73	3.49	2.35	2.34	....	W. S. Collier, M. D.
Setauket	5.49	3.27	7.38	2.88	4.49	1.69	1.61	5.60	6.44	4.76	4.83	3.80	52.24	S. B. Strong.
S. E. Reservoir	5.24	5.15	6.75	2.53	5.77	1.97	2.40	6.58	10.05	4.89	4.20	5.89	61.42	New England Meteorological Society.
Utica	4.32	4.23	7.50	3.87	3.81	3.68	3.08	3.80	3.58	4.97	4.85	3.46	51.15	Thomas Birt.
West Point	4.58	3.78	3.62	2.68	6.22	1.04	2.18	6.40	8.34	3.94	3.72	5.42	51.92	U. S. post hospital.
White Plains	5.34	10.43	3.67	9.68	6.55	2.32	1.58	6.42	7.60	4.25	5.00	4.41	67.25	Prof. O. R. Willis.
North Carolina:														
Chapel Hill	3.37	4.01	8.73	1.11	9.88	1.30	....	....	7.05	1.81	2.57	4.40	....	Prof. J. W. Gore.
Charlotte	4.38	4.26	6.22	2.36	5.64	1.66	1.68	6.93	8.25	5.87	1.69	3.67	52.61	Signal Service.
Hatteras	4.85	3.83	5.07	0.77	7.27	4.39	6.24	2.36	6,63	3.99	5.52	5.81	56.73	Do.
Kitty Hawk	5.65	4.54	6.75	1.17	5.80	4.65	3.92	2.21	9.40	5.42	3.16	7.06	59.73	Do.
Lenoir	1.90	4.60	4.73	2.30	1.00	1.90	2.60	3.80	1.08	5.10	5.10	2.70	36.81	Dr. R. L. Beall.
Monroe	3.38	....	7.56	2.51	....	1.38	3.00	4.08	....	4.76	1.70	3.72	....	State weather service.
Mount Holly	4.28	4.28	7.13	1.71	9.60	1.20	0.00	5.77	10.88	2.68	*1.37	3.22	52.12	Signal Service.
Mount Pleasant	4.67	....	5.85	3.12	....	3.81	....	2.18	....	7.09	1.69	3.60	....	State weather service.
Raleigh (1)	3.98	3.86	6,88	1.71	6.07	4.06	4.93	4.05	10.88	4.31	3.01	3.18	56.92	Signal Service.
Raleigh (2)	3.98	3.50	5.03	1.71	5.05	2.75	5.55	4.45	9.05	3.60	3.25	3.25	51.17	T. C. Harris.
Salisbury	4.38	....	7.60	1.34	....	0.93	1.98	4.26	....	....	2.09	3.53	....	State weather service.
Southport	2.76	6.25	7.05	1.41	3.46	2.33	3.72	9.25	8.14	6.98	6.30	3.20	60.85	Signal Service.
Statesville	5.07	4.05	8.28	2.52	9.54	2.62	5.18	5.38	1.36	5.68	2.88	3.30	55.86	W. A. Eliason.
Tarborough	....	....	5.53	1.77	8.09	5.17	1.62	2.85	....	....	....	....	....	E. V. Zoeller.

* Probably about three times greater than it should be.

† Incomplete.

Monthly and annual precipitation (in inches and hundredths) for 1888, etc.—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
North Carolina—Continued.														
Wadesborough	....	....	....	....	....	1.30	2.60	....	....	2.30	....	....	....	Signal Service.
Weldon	3.83	3.30	7.41	1.18	8.84	5.38	1.46	1.82	1.06	3.31	3.65	2.43	43.67	T. A. Clark.
Wilmington	2.21	6.22	4.74	1.10	4.41	3.56	5.87	4.61	8.28	5.65	5.50	2.92	55.07	Signal Service.
Ohio:														
Akron	2.74	1.61	2.55	1.26	2.90	3.09	4.31	6.05	3.43	3.03	4.20	1.46	36.63	State weather service.
Ashland	....	....	....	....	....	....	....	2.87	2.63	2.87	3.58	1.34	....	Do.
Athens	....	....	....	2.92	3.15	3.04	7.54	5.40	3.56	5.59	5.03	1.19	....	Do.
Bangorville	4.05	1.70	3.98	1.78	4.48	4.51	3.73	5.79	1.48	3.47	5.33	1.59	41.89	Do.
Bellevue	....	....	4.50	1.75	3.05	4.05	2.32	3.51	1.60	2.61	3.57	1.35	....	William Sheffield.
Canton	4.18	1.68	2.76	1.85	3.18	2.66	4.78	f4.45	....	2.86	....	....	....	State weather service.
Celina	3.14	0.95	3.95	2.50	4.03	4.75	1.30	2.25	0.75	4.35	4.80	1.15	33.92	Do.
Cincinnati	2.78	1.37	3.94	1.14	2.70	1.75	2.46	7.80	1.79	3.05	4.78	1.32	34.88	Signal Service.
Circleville	4.63	1.30	3.51	1.39	5.28	1.91	5.86	6.97	2.08	5.47	4.42	1.11	43.93	Signal Service.
Clarksville	4.26	2.01	4.26	2.29	4.88	5.14	2.87	10.13	0.76	3.97	4.42	1.32	46.31	State weather service.
Cleveland (1)	3.15	1.55	3.23	2.18	2.84	4.13	2.45	2.38	2.65	2.90	3.59	1.52	32.57	Signal Service.
Cleveland (2)	2.57	1.57	3.24	2.01	3.70	5.24	2.92	2.10	3.22	3.41	4.26	1.69	35.93	G. A. Hyde.
College Hill	3.50	3.50	6.62	2.00	4.50	3.00	3.75	9.00	5.00	7.00	3.00	1.50	52.37	John W. Hammitt.
Collinwood	....	....	....	....	....	4.83	3.09	3.88	2.29	3.01	4.32	1.77	....	William Smeed, Philip H. Cobb.
Columbus	3.73	1.30	3.79	1.53	3.89	1.62	5.81	4.34	0.91	3.77	3.26	1.11	35.06	Signal Service.
Dayton	3.52	1.25	4.40	1.67	3.95	1.92	3.44	5.53	1.34	5.14	5.52	1.13	38.81	State weather service.
Demos	....	....	....	....	....	....	....	7.10	4.20	4.17	2.95	0.34	....	B. B. Ault.
Ellsworth	2.51	1.07	1.52	1.90	3.28	2.94	4.31	2.74	3.95	3.20	4.14	1.28	32.84	State weather service.
Elyria	2.81	1.39	3.24	2.10	5.02	3.95	3.58	1.31	2.07	3.33	3.89	1.69	34.38	Charles W. Goodspeed.
Gallipolis	4.41	1.65	2.58	1.76	2.96	2.95	2.93	6.02	5.52	4.13	2.63	1.12	38.66	Signal Service.
Garrettsville	3.48	1.72	2.74	2.24	2.42	3.56	2.75	3.70	5.13	3.36	3.66	1.81	36.57	S. M. Luther.
Georgetown	4.28	2.26	4.91	2.75	2.45	4.83	4.98	8.49	1.62	4.70	5.46	1.38	48.11	State weather service.
Gracey	....	....	....	....	....	....	....	8.55	3.85	5.50	8.30	1.65	....	H. M. Scott.
Greenville	3.59	1.63	5.37	2.30	3.76	3.79	3.09	3.87	0.50	4.50	5.53	1.59	39.52	State weather service.
Hanging Rock	5.48	2.94	3.62	2.55	2.60	2.88	2.82	8.59	4.49	4.09	2.81	0.81	43.68	Do.
Hiram	3.70	1.63	3.08	2.52	3.21	5.41	2.89	4.45	4.61	3.20	3.62	1.62	39.94	Do.
Hudson	2.53	1.56	2.32	2.44	3.45	....	3.35	4.45	4.45	3.84	4.69	1.54	....	Do.
Jacksonborough	3.85	2.15	5.35	1.90	5.10	3.40	3.05	7.80	1.40	3.85	4.65	0.85	43.35	Dr. J. B. Owsley.
Jefferson	3.60	2.11	3.02	2.22	4.16	3.95	4.28	2.72	4.18	3.27	4.66	2.69	40.86	State weather service.
Logan	4.13	2.69	2.68	1.01	3.01	3.95	7.25	6.46	3.27	5.15	4.26	1.34	45.20	Do.
Lordstown	2.73	1.31	1.43	1.66	2.15	2.54	4.54	4.46	3.86	3.75	3.12	1.47	33.02	W. S. Dean.
McConnellsville	4.13	1.65	2.12	1.90	4.46	2.86	5.25	6.17	4.68	5.04	4.81	1.64	44.71	State weather service.
Marietta (1)	5.26	2.32	....	2.85	3.46	2.37	9.92	11.01	5.10	....	4.83	2.15	....	Signal Service.
Marietta (2)	4.63	1.30	3.99	3.06	2.97	2.24	10.48	11.55	4.64	5.04	4.07	1.45	55.42	State weather service.
Napoleon	2.23	1.21	2.95	1.19	3.00	4.22	2.04	2.02	0.16	1.71	4.71	1.45	26.89	Dr. T. C. Hunter.
New Alexandria	5.91	1.58	3.13	1.15	3.51	1.97	6.42	8.38	3.01	4.12	4.30	1.58	45.06	State weather service.

Newcomerstown	5.57	1.93	3.54	1.40	4.31	2.57	9.62	8.10	4.51	4.15	4.69	1.65	52.04	Do.
North Lewisburgh	6.15	1.70	5.90	2.50	4.50	2.45	4.15	6.05	1.25	4.85	5.75	1.85	47.10	H. D. Gowey.
Oberlin	2.05	1.15	2.59	1.44	3.60	3.64	3.64	2.10	2.48	2.63	2.55	1.21	29.08	State weather service.
Ohio State University	4.04	1.71	4.33	2.89	6.67	2.43	4.72	5.85	1.26	5.14	4.30	1.36	44.20	Do.
Ottawa	......	......	......	......	......	......	......	1.06	1.23	2.22	4.80	1.41	......	Do.
Paulding	......	......	2.96	1.88	3.49	6.89	3.30	1.31	......	......	......	......	......	Do.
Pomeroy	1.56	1.40	2.29	0.66	2.99	2.51	6.18	3.59	3.20	......	3.42	......	......	Do.
Portsmouth (1)	5.42	2.54	4.81	2.17	3.77	4.27	6.47	6.41	4.45	4.50	3.41	1.08	49.30	Signal Service.
Portsmouth (2)	4.49	2.62	4.67	2.32	3.70	4.27	6.46	7.63	3.17	4.51	3.39	1.05	48.28	Dr. D. B. Cotton.
Quaker City	5.28	2.74	3.25	1.64	3.63	4.11	7.32	8.52	[a]1.45	......	[b]2.14	2.66	......	State weather service.
Sandusky	2.14	1.26	2.85	1.61	2.30	3.96	3.58	1.98	1.41	1.89	2.35	1.12	26.45	Signal Service.
Savannah (Ruggles)	3.20	1.01	3.80	2.25	3.65	4.00	3.15	3.25	2.65	1.80	4.30	1.55	34.61	Peter Bowman.
Sidney	4.00	1.50	5.65	2.59	3.95	4.82	3.63	3.87	0.65	5.99	5.26	1.77	43.68	Signal Service.
Springborough	......	1.97	......	1.95	4.95	3.61	2.95	7.58	......	2.38	1.99	0.75	......	State weather service.
Tiffin	2.77	1.95	4.26	2.26	3.98	3.51	1.79	1.06	1.47	2.09	3.30	1.37	29.81	Rev. T. H. Sonedecker.
Toledo	2.18	0.75	3.63	0.86	3.26	3.69	2.92	1.97	0.68	1.64	3.02	1.26	25.86	Signal Service.
Upper Sandusky	3.83	2.70	4.55	2.75	4.03	2.98	2.84	4.17	1.39	2.38	4.01	1.89	37.52	State weather service.
Wapakoneta	......	4.03	......	......	6.40	2.44	......	......	0.25	2.89	2.24	2.16	......	Do.
Washington	3.29	0.84	......	......	4.18	4.00	2.82	......	......	......	......	......	......	Do.
Wauseon	2.40	1.96	3.64	2.27	3.36	3.52	0.86	1.95	0.84	1.93	4.06	1.88	28.67	Thomas Mikesell.
Waverly	3.89	1.89	3.78	2.69	......	......	......	8.06	......	......	......	......	......	State weather service.
Waynesville	3.98	......	4.80	2.38	4.00	2.47	4.09	6.23	1.57	5.27	5.11	1.44	......	Do.
Westerville	3.90	1.16	3.33	1.84	4.40	1.59	3.79	7.72	1.21	4.55	4.34	1.34	39.17	Prof. John Haywood.
West Milton	3.50	2.75	8.50	7.00?	7.50	4.50	8.25	5.50	1.75	10.00	9.52	2.60	71.37	Luke G. Motte.
Weymouth	1.73	1.46	2.62	2.56	4.85	4.80	4.08	4.69	4.33	3.47	4.28	1.43	40.30	State weather service.
Wooster	3.34	2.43	3.34	2.48	3.82	2.31	4.54	4.35	1.92	3.18	4.95	1.89	38.05	Signal Service.
Yellow Springs	2.85	1.26	4.07	1.87	4.05	1.74	4.91	4.07	0.50	5.47	5.14	1.33	37.26	C. W. Rice.
Youngstown	1.92	1.90	1.47	1.47	2.00	2.82	3.33	3.04	4.46	3.98	3.39	1.50	31.28	State weather service.
Zanesville	4.96	1.81	3.02	1.12	3.45	2.37	......	......	......	......	......	......	......	Signal Service.
Oregon:														
Albany	10.77	1.26	3.34	1.40	1.00	5.31	0.83	0.00	0.64	3.26	4.13	4.30	36.24	John Briggs.
Ashland	3.81	1.11	1.75	1.01	2.24	5.20	1.29	0.23	0.61	0.88	2.44	1.23	21.80	Signal Service.
Astoria	13.84	4.12	6.64	4.04	0.79	7.23	1.25	0.74	2.32	7.45	10.45	9.86	68.73	Do.
Bandon	11.26	2.69	7.23	1.38	1.04	5.48	0.12	0.00	0.61	6.44	5.21	6.29	47.75	George Bennett.
East Portland	10.00	2.06	1.13	1.06	0.04	6.10	0.05	0.00	0.15	5.06	4.00	4.23	33.88	Dr. George Wigg.
Eola	11.68	2.08	3.21	0.89	1.00	5.06	0.73	0.00	0.54	2.72	4.30	2.59	34.80	Thomas Pearce.
Klamath, Fort (1)	5.71	1.38	2.01	0.41	2.60	3.14	0.92	0.13	0.96	0.29	2.22	3.82	23.59	Signal Service.
Klamath, Fort (2)	4.36	1.32	1.23	2.60	2.34	2.16	0.84	......	......	......	......	......	......	U. S. post hospital.
La Grande	1.97	1.69	1.16	1.02	0.73	3.15	1.00	......	......	......	......	......	......	Rev. J. K. Romig.
Lake View	2.85	......	......	0.02	2.80	1.55	0.84	0.01	0.18	0.28	......	......	......	Signal Service.
Linkville	2.77	0.70	1.39	0.20	2.19	2.33	[k]0.39	......	0.98	0.33	1.44	0.99	......	Do.
McMinnville	......	0.05	3.40	1.56	0.69	6.37	0.50	0.02	0.87	3.69	4.48	3.35	......	Prof. W. J. Crawford.
Mount Angel	......	......	......	......	......	......	0.78	0.00	0.84	5.43	5.01	6.73	......	Rev. F. Barnabas Held.
Portland	8.50	2.42	2.87	2.06	0.68	5.38	1.04	0.05	1.13	4.97	4.47	5.19	38.76	Signal Service.
Roseburgh	6.62	2.81	2.39	0.63	1.15	5.94	1.05	0.07	0.63	2.82	3.54	3.54	31.19	Do.
Siskiyou	......	2.05	2.20	1.15	......	......	......	......	......	......	......	2.46	......	Pacific Railway system.
Woodville	7.73	2.17	2.39	0.55	3.83	3.68	1.27	0.00	0.08	......	......	......	......	C. W. Clark.
Yaquina light-house	13.67	2.94	7.76	2.50	1.34	6.82	1.34	0.00	2.24	2.11	......	......	......	Dr. J. G. Joseph.
Pennsylvania:														
Altoona	3.97	1.17	1.75	2.34	4.08	2.38	2.78	5.36	3.05	2.90	2.45	1.44	33.62	Charles B. Dudley.
Beaver	......	......	......	......	......	......	5.18	6.95	3.20	3.02	......	......	......	State weather service.
Bernice	2.95	4.46	3.63	3.03	2.55	1.15	......	6.21	4.22	4.05	......	......	......	Do.

Monthly and annual precipitation (in inches and hundredths) for 1888, *etc.*—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Pennsylvania—Continued.														
Bethlehem	5.09	3.50	3.84	3.32	2.33	3.12	2.73	9.20	10.93	2.77	3.82	3.59	54.24	State weather service.
Blooming Grove	3.90	2.50	4.62	2.80	3.20	3.50	6.60	7.70						John Grathwohl.
Brookville	4.47	1.06	2.03	2.44	2.12	1.60				1.24	2.52	2.23		Signal Service.
Carlisle	3.30	3.37	2.91	2.79	5.14	3.25	3.48		3.29	3.19	2.88	2.77		State weather service.
Catawissa	3.58	2.03	2.59	2.91	5.20	2.78	2.48	6.28	3.74	3.82	3.79	3.97	43.17	Robert M. Graham.
Chambersburgh	2.12	3.95	1.78		5.55	2.37	2.90	5.45						State weather service.
Charlesville	4.06	1.92	3.42	2.14	4.83	3.00	3.99	7.05	3.37	2.52	3.01	1.63	40.94	Do.
Clarion	5.65	1.55	2.43	3.16	3.79	5.42	3.01	5.87	2.97	5.33	4.40	2.47	46.05	Signal Service.
Clarion (State normal school).	4.88	1.79		2.82	3.46				2.82	5.15		2.75		State weather service.
Coatesville			6.28	2.02	2.89	1.76	3.91	4.20	6.99	2.93	3.86	5.25		Do.
Columbus	3.32	2.03	1.74	3.30	2.80	4.36	2.61	3.15	4.13	4.22	3.81	3.00	38.49	Do.
Confluence	7.62	2.02	3.30	2.76	5.38	3.40				5.47	3.05	2.25		Signal Service.
Corry	3.32	2.03	1.74	3.30	2.80	4.38	2.16	3.15	4.13	4.22	3.81	3.00	38.04	William Loveland.
Coudersport				3.00	3.80	6.90	1.40	4.20	3.00	4.60	2.10			State weather service.
Drifton	3.79	2.63	3.11	2.68	5.69	4.18	2.16	11.27	7.63	4.75	4.84	2.05	54.78	H. D. Miller.
Dyberry	4.38	3.07	4.01	2.98	3.86	2.07	4.19	7.46	6.49	3.97	4.61	3.40	48.22	Theo. Day.
Eagle's Mere	6.16	3.87	4.34	3.47	3.70	2.69	3.92	9.25	6.34	9.18	6.22	4.77	63.91	State weather service.
Easton	6.45	3.91	3.95	3.96	3.18	1.49	2.83	9.39	11.75	2.97	3.79	4.17	57.84	Dr. J. W. Moore.
Emporium			2.88	2.91	4.63	6.57	2.17	4.28	2.57	4.15	2.56	2.94		State weather service.
Erie	2.79	1.66	2.04	2.70	[illegible]	2.38	3.17	3.76	2.86	3.17	3.88	1.77	31.94	Signal Service.
Franklin (1)	4.42	2.08	2.41	2.38	5.80	6.02	4.58	5.52	4.95	4.58	3.98	2.50	49.22	Joseph Bell.
Franklin (2)					4.09	6.53	2.77	5.52						State weather service.
Freeport	7.68	2.20	3.45	2.03	3.33	4.14				3.13	4.00	1.92		Signal Service.
Germantown	6.65	0.89	6.36	2.58	4.50	1.55	3.80	5.04	6.41	4.85	3.87	3.81	50.31	Thomas Meehan.
Girardville	3.50	3.45	4.35	3.29	7.08	6.50	3.34	6.58	8.18	4.83	4.90	4.62	60.62	State weather service.
Grampian Hills	5.47	1.73	3.00	2.27	4.58	2.30	3.66	8.19	4.37	4.50	3.86	2.89	46.82	Nathan Moore.
Greensburgh	5.06	1.28	3.77											State weather service.
Greenville	3.50	1.63	1.92	2.73	2.63	3.44	3.95	3.18	4.07	3.16	5.17	1.61	36.99	Do.
Harrisburg							3.27	6.28	4.47	2.04	2.31	2.50		Signal Service.
Hollidaysburgh	5.69	2.12	2.55	2.38	6.94	2.31	3.73	7.26	3.34	3.85	3.05	1.68	44.90	State weather serviee.
Honesdale					2.98	2.39	3.75	5.59	7.17	3.92	3.97	3.63		Do.
Huntingdon	6.04	1.83	3.26	2.66	8.41	2.85	3.61	8.53	4.13	3.49	2.95			Do.
Indiana	6.75	1.84	3.34	2.98	5.30	4.60	7.04	10.65	2.82	5.48	2.75	2.52	56.07	Do.
Johnstown (1)	8.75	1.86	3,12	2.84	5.62	3.55	3.33	5.54	4.37	0.30	2.00	1.93	43.21	Signal Service.
Johnstown (2)				3.24	4.74	3.73	4.33	8.84	4.76					State weather service.
Kutztown			3.65	2.16	3.11	4.25		10.95	3.95	3.62				Do.
Lancaster	4.79	2.52	4.50	2.02	3.39	2.56	4.12		6.02	3.14	2.97	3.50		Do.
Lebanon	1.64	3.89	4.08	3.12	5.08	2.57	2.50	7.73	4.96	3.22	3.26	3.77	45.78	Do.
Lock Haven			2.33	2.51	3.87	2.00	4.75	7.32	4.52	5.22	4.59	3.31		Do.

Lock No. 4	6.13	1.54	3.91	1.59	3.27	2.32	6.09	9.02	3.37	5.01	3.22	1.82	47.29	Signal Service.
McConnellsburgh	4.82	2.76	8.76	2.54	4.70	3.10	2.68	8.61	4.03	3.62	3.14	2.70	45.96	State weather service.
Mahoning	2.74	0.82	2.31	2.72	3.89	3.16	4.79	3.34	3.06	4.99	3.89	1.86	37.07	Signal Service.
Meadville (1)	2.10	....	1.72	2.88	2.69	3.15	2.51	4.79	5.45	4.58	3.41	3.00	....	David Logan.
Meadville (2)	4.49	1.55	....	2.71	2.56	....	....	....	....	....	3.22	5.30	....	Prof. J. H. Montgomery.
Montrose	....	....	....	3.25	3.03	1.16	2.38	7.89	4.34	....	....	....	....	State weather service.
New Bloomfield	2.47	2.92	3.95	2.75	6.55	3.50	2.47	7.03	6.28	3.98	2.89	3.63	48.42	Do.
New Castle	2.77	1.83	2.01	2.95	2.73	3.25	4.90	6.38	2.82	3.99	3.99	2.45	40.07	Do.
New Geneva	6.29	1.63	3.89	2.18	3.95	....	....	....	....	....	....	....	....	Do.
Oil City	4.57	0.79	2.30	3.24	1.30	2.58	1.24	0.71	1.29	0.54	2.98	1.26	22.80	Signal Service.
Parker's Landing	5.20	1.76	2.09	2.19	5.45	....	....	....	....	3.22	3.53	1.76	....	Do.
Philadelphia	4.30	2.57	5.42	2.10	3.46	1.09	3.38	5.86	5.78	3.23	3.77	3.15	44.06	Do.
Philipsburgh	4.66	0.89	2.06	1.31	4.66	1.11	4.13	7.19	3.37	4.46	3.57	2.28	39.69	G. F. Dunkle.
Pittsburgh	6.17	1.74	2.51	1.04	4.13	2.22	4.86	7.26	1.77	3.46	3.57	1.66	39.89	Signal Service.
Pottstown	4.31	4.08	5.35	2.87	4.25	1.55	3.31	6.13	7.32	2.82	3.42	4.80	50.21	State weather service.
Quakertown	4.45	4.26	4.94	4.23	3.02	1.85	3.44	8.58	9.36	3.72	3.71	4.75	56.31	J. L. Heacock.
Reading	4.66	3.50	5.19	3.62	4.27	3.33	2.49	6.65	7.57	3.77	4.06	3.44	52.55	C. M. Dechant.
Rochester	....	....	....	1.19	3.32	2.51	....	....	....	....	....	....	....	State weather service.
Salem Corners	....	....	....	....	2.37	2.84	3.09	5.54	9.40	....	....	....	....	T. B. Orchard, M. D.
Saltsburgh	7.73	1.66	3.25	1.64	4.26	2.45	....	....	....	4.38	2.50	2.22	....	Signal Service.
Scranton	4.36	3.25	3.01	2.05	3.13	2.75	....	....	5.11	3.81	4.36	2.85	....	State weather service.
Selin's Grove	....	....	....	....	....	....	....	10.12	5.35	....	2.40	3.09	....	Do.
Shamokin	2.57	2.61	3.02	2.13	6.11	1.88	2.47	6.58	5.58	2.75	1.99	....	....	Do.
Smethport	....	....	....	....	....	5.02	1.41	6.78	3.63	7.66	4.01	2.21	....	Do.
Somerset	6.40	1.34	3.25	2.54	5.85	2.76	4.30	7.68	3.26	5.47	2.74	2.21	47.80	Do.
State College	3.46	1.70	2.90	2.79	6.26	2.61	2.78	6.16	3.12	3.76	2.71	2.07	40.32	Agricultural Experiment Station.
Stroudsburgh	....	....	3.62	3.36	5.13	3.11	3.44	....	....	....	....	....	....	State weather service.
Swarthmore	4.57	2.74	5.41	2.64	3.02	1.32	2.91	6.75	6.43	4.75	4.13	3.65	48.35	Do.
Tionesta	....	....	....	....	....	....	....	4.40	6.40	4.70	....	2.25	....	Do.
Troy	....	....	....	1.90	....	....	2.80	....	1.91	3.26	2.55	2.18	....	M. Gustin.
Uniontown	5.69	1.26	3.00	1.42	4.72	4.65	7.10	10.28	2.84	5.16	3.36	2.67	52.10	State weather service.
Warren	2.13	1.39	1.80	3.20	4.33	4.22	....	....	....	1.64	3.06	3.41	....	Signal Service.
Washington	5.56	0.01	3.32	0.99	....	....	....	....	....	....	....	....	....	
Wellsborough	3.70	4.54	3.60	2.49	3.16	3.90	3.50	5.76	1.75	6.69	3.68	5.91	48.68	Hiram D. Deming.
West Chester	5.89	4.97	6.89	2.48	4.11	1.79	4.47	3.39	7.50	3.11	3.94	4.97	53.01	State weather service.
Westtown	5.11	5.43	3.13	....	2.28	2.23	3.63	3.14	5.63	....	....	4.08	....	Wm. F. Wickersham.
Wysox	2.63	1.25	2.07	1.82	2.31	2.75	2.31	6.13	4.40	3.24	3.27	2.51	34.69	State weather service.
York	2.70	2.20	3.78	1.17	5.10	2.23	2.84	5.65	4.05	2.24	2.68	3.62	38.26	Do.
Rhode Island:														
Block Island	2.12	1.14	2.80	1.35	3.54	0.62	1.03	1.32	5.49	2.37	4.17	1.28	27.18	Signal Service.
Bristol	4.15	3.11	7.14	2.15	5.41	1.32	3.02	5.26	6.74	2.74	6.76	2.95	50.75	New England Meteorological Society.
Kingston	....	....	....	....	....	....	....	4.19	8.32	3.54	9.57	3.80	....	Do.
Lonsdale	4.58	4.19	5.38	2.85	6.65	1.62	1.96	7.59	8.80	6.33	8.38	5.50	63.83	Do.
Narragansett Pier	5.33	2.92	7.87	2.56	7.29	0.66	1.97	4.35	7.55	2.98	7.05	3.13	53.66	Signal Service.
Pawtucket	5.00	4.70	7.09	2.78	7.32	1.48	1.66	7.53	8.81	5.76	8.56	5.22	65.91	New England Meteorological Society.
Providence (1)	4.63	4.29	6.65	....	....	....	....	7.84	9,19	5.47	9.02	4.37	....	Do.
Providence (2)	4.44	4.23	5.61	2.84	5.26	0.95	....	7.18	5.73	5.43	8.24	4.34	....	Do.
Woonsocket	4.64	3.57	5.37	2.68	5.78	2.04	2.51	5.73	9.14	4.34	6.82	5.64	58.26	Do.

Monthly and annual precipitation (in inches and hundredths) for 1888, etc.—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
South Carolina:														
Abbeville	5.52	7.75	7.89	1.16	10.80	1.65	5.09	4.86	18.66	2.27	1.56	......	......	State weather service.
Aiken	3.95	5.89	7.87	1.60	6.68	5.39	4.23	5.60	12.06	5.49	2.15	4.46	65.37	Dr. W. H. Geddings.
Allendale	......	......	......	1.77	6.75	2.95	1.50	5.10	10.44	7.83	......	......	......	Signal Service.
Batesburgh	......	......	......	0.82	8.55	3.47	2.53	4.65	10.44	5.18	......	......	......	Do.
Belfast	2.78	6.25	6.04	......	......	......	......	......	......	......	......	......	......	State weather service.
Black's	......	4.29	4.18	0.87	4.34	T	......	......	......	......	......	......	......	Do.
Blackville	......	......	......	0.75	8.60	3.82	3.92	6.76	8.52	4.48	......	......	......	Signal Service.
Branchville	......	......	......	1.31	......	0.71	......	4.10	5.26	2.38	......	......	......	Do.
Brewer Mines	1.38	4.84	7.74	2.38	6.35	0.81	2.44	3.80	13.48	4.11	1.83	5.12	54.28	State weather service.
Camden	......	......	......	......	......	......	2.70	2.00	6.52	3.67	1.50	4.26	......	Do.
Cedar Springs	4.52	2.52	8.16	1.49	11.35	3.40	3.66	5.48	11.60	4.35	3.80	3.42	63.25	J. F. Bayerly.
Charleston	1.95	3.64	3.64	1.38	5.82	3.14	6.06	4.01	5.33	4.83	7.54	2.12	49.46	Signal Service.
Cheraw	3.01	4.27	5.35	1.34	4.73	4.53	3.49	4.19	6.31	2.34	1.15	3.06	43.77	Do.
Chester	......	......	......	1.74	6.71	......	3.22	2.04	7.03	3.88	......	......	......	Do.
Clinton	......	1.48	7.66	0.79	8.25	......	1.97	4.19	16.26	3.92	2.23	3.82	......	State weather service.
Columbia	2.30	4.25	6.20	0.91	6.66	2.18	4.57	5.49	5.71	4.29	2.28	3.07	47.91	Signal Service.
Conway	......	3.17	4.79	2.18	7.63	1.53	4.25	3.58	......	......	7.53	......	......	State weather service.
Evergreen	2.42	7.50	7.85	1.78	5.60	2.62	4.44	6.53	10.50	4.06	......	3.80	......	Do.
Florence	2.33	......	......	0.91	6.38	1.12	5.09	3.08	7.28	3.76	......	......	......	Signal Service.
Georges	......	......	......	1.30	7.11	2.71	4.02	3.11	8.93	5.69	......	......	......	State weather service.
Greenville	......	......	9.39	2.72	8.60	......	......	......	......	......	......	......	......	Signal Service.
Greenwood	4.34	......	......	1.07	6.58	1.62	2.75	6.47	17.90	3.27	......	......	......	Do.
Hardeeville	1.83	4.26	2.87	0.46	4.75	6.43	3.14	3,68	7.12	6.22	2.73	3.12	46.61	Do.
Jacksonborough	......	......	......	1.34	8.66	5.58	4.17	4.80	11.83	5.60	......	......	......	Do.
Kingstree	......	......	......	1.68	8.49	4.14	......	1.52	9.39	3.59	......	......	......	Do.
Kirkwood	2.25	3.24	6.83	1.26	9.15	2.80	2.00	2.70	6.52	3.67	1.50	4.26	46.18	Colin Macrae.
Marion	1.21	4.61	7.36	1.39	4.77	3.37	......	5.37	11.29	3.41	......	......	......	State weather service.
Newberry	3.86	6.43	8.40	1.85	7.90	3.21	2.19	4.62	17.90	4.51	3.10	3.63	67.60	Do.
Orangeburgh	......	......	4.01	1.02	4.74	4.00	......	......	......	......	......	......	......	Do.
St. Matthews	......	......	......	0.28	10.54	2.21	5.73	5.48	5.84	4.00	......	......	......	Signal Service.
Spartanburgh	......	......	10.05	1.07	11.55	......	3.22	5.75	12.30	3.20	2.40	......	......	State weather service.
Statesburgh	2.14	4.08	5.90	0.83	6.68	2.34	4.10	4.22	5.31	3.05	1.76	3.98	44.39	Dr. W. W. Anderson.
Timmonsville	......	......	......	......	4.61	2.35	5.22	2.92	8.55	2.01	2.48	3.52	......	State weather service.
Trial	......	......	......	......	11.28	3.28	4.68	3.70	8.02	4.75	3.31	3.08	......	Do.
Williamstown	......	......	6.23	2.32	8.49	2.39	3.81	6.56	9.04	......	......	......	......	Do.
Windsor	......	......	......	......	......	......	2.57	6.90	11.49	......	......	......	......	Do.
Winnsborough	3.41	5.67	9.28	0.88	8.99	4.00	2.60	3.64	13.23	4.65	1.32	3.26	60.93	Do.
Yorkville	......	......	......	......	......	1.67	2.12	5.74	9.06	4.50	2.27	3.65	......	Do.
Tennessee:														
Andersonville	3.80	5.34	5.38	2.68	5.47	3.68	3.14	5.02	5.38	7.22	3.40	1.12	51.63	State weather service.

Ashwood	3.82	3.31	7.43	3.72	4.02	3.79	4.27	11.93	3.42	3.40	6.06	1.35	56.52	Rev. C. F. Williams.
Austin	2.85	2.34	5.27	3.02	2.86	4.16	1.99	6.85	4.97	3.67	3.03	1.57	42.58	P. B. Calhoun.
Beech Grove	4.29	2.53	......	4.72	4.13	5.86	3.11	......	4.98	......	......	......	......	State weather service.
Carthage	6.13	3.40	5.93	2.43	3.28	5.61	3.65	......	......	......	......	1.68	......	Signal Service.
Charleston	6.72	4.90	5.71	......	......	......	......	......	......	......	......	1.58	......	Do.
Chattanooga	6.79	4.92	6.86	4.43	4.91	3.31	2.07	5.34	4.42	5.17	4.66	1.99	54.87	Do.
Clinton	8.86	4.97	6.95	......	......	......	......	......	......	......	......	1.98	......	Do.
Columbia	1.80	2.80	2.30	2.07	2.50	5.10	4.70	7.20	4.27	3.40	5.40	1.50	43.04	Do.
Cookeville	7.16	4.21	7.78	......	......	......	......	......	3.34	......	......	......	......	State weather Service.
Covington	4.76	3.04	5.37	1.71	2.57	2.75	1.56	9.86	1.48	4.06	3.95	3.50	44.61	Signal Service.
Fayetteville	2.59	4.17	7.68	2.39	4.93	3.12	1.82	3.36	3.17	3.29	4.43	2.59	43.54	State weather service.
Florence Station	2.88	3.51	6.70	3.99	3.31	5.26	3.26	8.97	3.09	3.04	4.41	1.59	50.01	Do.
Fostoria	4.90	4.50	8.50	4.50	5.05	6.80	5.00	6.30	2.20	5.50	4.20	1.55	59.00	Do.
Greeneville	4.71	2.84	3.42	2.25	4.50	2.25	2.40	4.24	3.58	5.40	2.35	1.88	39.82	Do.
Grief	5.23	3.76	......	......	......	......	......	......	......	......	......	1.91	......	Do.
Hohenwald	3.09	2.69	7.85	2.87	2.21	3.90	2.48	10.87	4.10	3.98	5.03	1.44	50.51	Do.
Jacksborough	......	......	......	......	......	......	......	6.44	3.71	5.33	5.08	1.41	......	Do.
Johnsonville	4.79	1.62	5.30	2.36	2.90	4.56	1.26	6.02	2.04	2.29	2.86	0.95	37.95	Signal Service.
Jonesborough	......	0.92	2.12	2.85	......	......	......	......	......	......	......	......	......	State weather service.
Kingston Springs	......	2.90	5.77	3.46	1.95	2.51	2.83	5.78	3.40	4.12	3.75	1.89	......	Do.
Kingston	9.44	5.24	6.36	......	......	......	......	......	......	......	......	0.21	......	Signal Service.
Knoxville	6.61	3.75	4.22	4.00	6.30	4.18	3.45	2.77	6.55	6.11	3.19	1.90	53.03	Do.
Lawrenceburgh	6.28	4.56	9.90	2.92	2.75	3.28	0.55	......	......	......	......	2.93	......	State weather service.
Leeville	......	......	......	......	......	......	......	......	......	2.51	3.62	1.43	......	Do.
Lewisburgh	......	3.27	......	......	......	4.52	1.86	7.72	2.41	2.56	......	2.18	......	Do.
Loudon	7.64	4.26	4.68	......	......	......	......	......	......	......	......	1.75	......	Signal Service.
McKenzie	......	......	......	......	......	......	......	......	0.40	1.40	4.75	0.60	......	State weather service.
Maryville	......	......	4.00	3.99	5.81	3.05	3.62	2.73	......	......	......	......	......	Do.
Memphis	4.04	2.49	5.40	1.15	2.35	4.32	2.12	10.44	1.06	3.51	6.53	3.41	46.82	Signal Service.
Milan	6.03	1.90	5.28	2.45	1.90	4.17	1.49	10.00	0.64	3.01	4.66	2.00	43.53	M. D. L. Jordan, M. D,
Nashville	6.29	3.78	6.46	4.18	2.97	4.68	2.36	7.03	3.82	2.82	4.33	1.77	50.49	Signal Service.
Newport	......	......	4.25	3.30	8.00	2.10	......	......	......	......	......	......	......	State weather service.
Nunnelly	4.20	2.17	7.03	3.11	2.55	8.00	1.06	8.03	3.06	8.03	3.90	1.15	47.29	Do.
Parksville	4.65	3.49	5.40	2.01	5.10	3.96	......	4.37	......	4.49	3.01	1.40	......	Do.
Riddletown	4.12	3.16	8.04	3.62	4.32	7.74	4.15	8.05	6.73	5.19	4.36	1.66	61.14	F. K. Fergusson.
Rockwood	10.05	3.30	5.80	......	......	......	......	......	......	......	......	2.20	......	Signal Service.
Rogersville	2.84	1.69	3.42	3.12	3.37	3.39	2.52	5.32	4.46	6.58	3.52	1.45	41.68	Do.
Savannah	3.40	......	8.06	......	2.18	3.15	1.99	......	2.11	......	5.67	1.58	......	State weather service,
Springdale	......	......	......	......	......	......	......	......	3.51	6.60	3.67	1.76	......	Do.
Strawberry Plains	5.79	3.80	3.93	......	......	......	......	......	......	......	......	2.02	......	Signal Service.
Trenton	4.73	2.14	5.72	1.63	4.19	3.89	1.18	8.62	1.94	2.85	5.16	2.15	44.20	State weather service.
Watkins	......	3.06	5.94	4.50	1.97	3.20	2.78	6.02	6.03	2.41	3.81	1.47	......	Do.
Waynesborough	1.45	2.60	7.13	2.12	1.92	5.53	3.90	9.18	2.19	2.60	5.28	1.18	45.08	Do.
Texas:														
Abilene	0.76	2.40	1.16	5.16	3.63	2.79	0.46	4.08	0.05	2.00	4.80	3.29	30.58	Signal Service.
Austin	1.17	7.22	2.49	6.57	5.87	4.63	0.95	6.38	1.16	4.45	6.61	4.29	51.79	Os.ar Samostz.
Brady	0.65	1.59	2.17	6.39	1.77	2.35	3.80	5.01	1.70	2.40	3.12	2.84	33.79	W. H. Potter.
Brownsville	1.98	1.09	2.31	4.79	1.77	2.95	1.30	0.95	7.47	2.95	4.99	0.93	32.58	Signal Service.
Cedar Hill	5.00	3.50	5.25	9.00	1.30	7.50	2.50	7.00	4.00	1.00	5.00	4.00	55.05	J. P. Berry.
Clark, Fort	......	......	......	......	......	......	......	......	......	2.28	2.03	1.00	......	U. S. post hospital.
Cleburne	1.09	3.80	2.85	5.15	5.20	4.00	1.36	8.40	0.45	2.35	2.37	2.90	39.92	P. J. Norwood.
Comanche	......	2.18	2.25	7.18	3.43	1.18	0.90	1.75	......	......	......	......	......	E. A. Wiesendanger.

Monthly and annual precipitation (in inches and hundredths) for 1888, etc.—Continued.

States and stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Authority.
Texas—Continued.														
Concho, Fort	1.10	1.98	0.92	3.63	1.37	1.66	3.10	2.56	0.48	1.72	2.20	0.40	21.12	U. S. post hospital.
Corpus Christi	1.91	3.50	2.99	1.45	8.72	5.46	2.25	2.16	7.25	2.91	8.64	0.92	48.16	Signal Service.
Corsicana	3.46	4.91	4.70	3.75	12.33	4.68	3.48	2.92	2.90	1.03	3.82	4.45	52.43	W. H. Hamilton.
Davis, Fort (1)	1.91	0.89	0.40	1.21	1.11	1.59	2.43	3.24	1.68	1.93	1.46	0.26	18.11	Signal Service.
Davis, Fort (2)	......	......	......	......	......	......	......	......	1.23	1.70	0.99	0.21	......	U. S. post hospital.
Decatur	1.31	3.01	3.59	3.13	6.94	3.66	2.16	8.73	0.74	1.49	3.69	3.74	42.19	H. D. Donald.
Elliott, Fort (1)	0.32	0.61	0.40	2.69	3.19	1.34	2.50	2.27	0.71	0.85	0.79	0.84	16.51	Signal Service.
Elliott, Fort (2)	......	......	......	......	......	......	......	......	0.76	0.72	0.76	0.71	......	U. S. post hospital.
El Paso	0.32	1.51	0.95	0.74	0.15	0.42	1.39	1.32	0.49	1.13	1.32	0.05	9.79	Signal Service.
Gallinas	......	......	......	5.21	4.30	2.20	1.94	9.40	1.30	1.46	3.83	2.01	......	Lum Woodruff.
Galveston	2.70	7.54	2.84	3.13	5.18	9.77	1.54	14.46	3.32	5.67	6.73	3.00	65.88	Signal Service.
Lampasas	......	......	......	4.61	5.16	5.05	1.24	3.86	1.69	1.13	3.85	2.46	......	Dr. C. M. Ramsdell.
McIntosh, Fort	1.38	0.93	1.11	5.78	1.50	1.11	0.21	3.87	4.42	0.37	0.51	0.45	21.64	U. S. post hospital.
Mesquite	1.69	4.92	4.06	2.29	9.73	5.55	1.84	10.70	2.14	0.63	4.34	4.27	52.16	Silas G. Lackey.
Mexia	......	......	......	......	7.15	4.58	2.20	2.69	2.00	0.55	6.68	5.64	......	Charles F. Mercer.
New Ulm	2.70	4.66	2.72	3.76	7.74	10.42	1.74	4.34	2.01	3.50	5.34	4.52	53.45	C. Runge.
Palestine	4.50	4.74	9.48	6.62	6.64	5.80	4.39	3.21	0.27	1.51	5.92	6.58	59.66	Signal Service.
Paris	......	......	......	......	......	4.25	......	2.37	1.59	......	......	......	......	Do.
Ringgold, Fort	0.67	0.14	1.71	3.78	1.21	3.34	0.28	1.46	5.71	......	0.92	0.58	......	U. S. post hospital.
Rio Grande City	0.67	0.16	1.84	3.50	1.31	4.00	0.64	1.40	5.53	1.57	1.36	0.76	22.74	Signal Service,
San Antonio	1.61	2.56	2.13	7.72	4.25	4.00	0.79	7.76	1.93	0.82	4.58	2.40	40.55	Do.
Silver Falls	0.44	1.59	0.93	4.45	1.21	......	T	4.29	0.27	1.88	4.68	0.86	......	C. M. Tilford.
Utah:														
Blue Creek	2.10	0.15	0.55	......	......	......	......	......	......	......	......	0.95	......	Pacific Railway system.
Brock's	......	......	3.10	0.25	1.48	0.01	2.40	1.66	0.21	0.54	0.69	0.10	......	Signal Service.
Corinne	2.70	0.75	1.35	......	......	......	......	......	......	......	0.65	1.90	......	Pacific Railway system.
Kelton	1.50	0.35	0.70	......	......	......	......	......	......	......	0.45	1.39	......	Do.
Lake Park	......	......	......	......	......	......	......	0.10	1.00	1.14	0.92	2.06	......	E. Olson and F. Blumel.
Ogden	2.60	1.06	1.20	......	......	......	......	......	......	......	1.06	2.43	......	Pacific Railway system.
Promontory	2.70	......	1.31	......	......	......	......	......	......	......	0.22	2.10	......	Pacific Railway system.
Salt Lake City	1.52	1.22	2.18	0.99	0.34	0.98	0.24	0.63	0.51	0.80	2.00	2.21	13.62	Signal Service.
Vermont:														
Brattleborough	4.35	4.33	7.46	3.58	3.56	2.70	1.43	7.18	8.01	6.09	5.65	3.21	57.50	W. H. Childs.
Burlington	1.06	0.79	2.56	1.93	3.26	3.95	1.47	4.10	5.68	3.94	3.60	1.63	33.97	W. B. Gates.
Chelsea	3.32	2.19	3.27	2.94	3.76	5.22	2.74	3.78	5.39	3.87	4.28	2.92	43.68	New England Meteorological Society.
Cornwall	2.65	1.89	4.55	2.09	2.67	3.75	1.18	......	3.06	4.44	3.28	3.55	......	Do.
Coventry	......	......	......	......	......	......	......	......	8.55	5.95	4.83	4.30	......	W. H. Tibbetts.
East Berkshire	......	......	......	......	......	......	......	......	2.45	4.23	6.40	3.05	......	J. H. Mears.

Jacksonville	5.11	5.13	7.22	4.97	6.15	4.57	2.63	6.50	7.80	6.86	6.92	3.90	67.76	New England Meteorological Society.
Lunenburg	3.05	1.25	4.80	0.90	4.55	2.69	1.20	6.58	5.41	5.25	4.84	3.07	43.59	Dr. H. A. Cutting.
Manchester	4.67	4.74	5.05	4.04	6.18	6.18	1.98	5.91	7.04	5.65	6.70	4.61	62.75	Rev. E. P. Wild.
Marlborough	5.03	4.34	6.41	3.63	....	....	....	....	....	....	....	....	....	New England Meteorological Society.
Middlebury	....	....	4.67	1.45	3.06	4.20	1.62	3.10	4.82	4.78	3.59	4.90	....	S. Holton.
Newport	4.50	1.80	3.95	1.20	[b]2.20	3.00	2.20	3.10	4.35	6.20	....	....	....	M. B. Trasher.
Northfield	4.99	2.73	4.81	2.87	3.51	6.17	1.30	3.43	6.27	3.53	3.82	2.46	45.89	Signal Service.
St. Johnsbury	....	....	4.28	1.50	3.00	5.03	1.05	4.67	4.29	4.19	2.65	1.90	....	Franklin Fairbanks.
Strafford	3.80	2.00	4.60	3.00	3.60	2.50	3.00	4.70	6.10	4.85	6.20	3.50	47.85	H. F. J. Scribner.
Vernon	4.67	4.33	7.27	3.77	3.98	2.37	1.16	6.88	10.94	6.71	5.43	3.01	60.52	New England Meteorological Society.
Woodstock	2.70	2.92	4.53	....	....	....	....	....	....	....	....	....	....	Do.
Virginia:														
Bird's Nest	4.10	2.55	8.55	4.10	4.75	4.15	2.45	3.95	5.50	2.21	3.60	2.15	48.06	C. R. Moore.
Cape Henry	4.12	4.31	4.70	0.77	8.17	4.76	1.66	2.54	4.88	2.48	3.07	2.44	43.90	Signal Service.
Christiansburg	3.04	2.34	3.25	1.39	4.90	3.01	1.41	2.02	8.82	4.28	1.48	1.43	37.37	Do.
Dale Enterprise	1.92	2.63	4.38	1.44	5.04	4.98	3.61	7.02	4.40	2.90	2.73	1.82	42.87	L. J. Heatwole.
Lynchburg	2.99	3.59	5.25	1.67	5.75	2.24	2.59	4.47	10.58	4.41	2.74	2.20	48.48	Signal Service.
Marion	4.82	2.69	3.52	1.90	3.87	3.67	2.05	5.56	5.78	5.94	1.08	2.39	43.27	A. T. Lincoln.
Monroe, Fort	3.32	3.75	4.37	0.93	7.35	7.11	3.08	8.08	5.00	2.37	1.49	2.97	44.82	U. S. post hospital.
Norfolk	4.42	2.41	4.55	0.97	8.46	5.79	5.26	7.81	6.10	3.94	3.71	3.22	56.64	Signal Service.
Petersburgh	2.45	2.94	8.58	0.96	8.30	8.12	7.00	5.45	9.84	3.10	3.51	2.73	57.98	Prof. James M. Colson.
Rappahannock	6.03	1.89	14.45	4.94	10.63	4.38	5.76	3.87	....	....	....	....	....	W. H. Ireland.
Spottsville	....	....	....	....	....	....	....	....	....	3.05	3.80	2.50	....	B. W. Jones.
University of Virginia	2.25	4.18	4.69	1.79	6.28	3.86	3.08	5.40	13.10	3.44	4.65	3.54	56.26	James Wearmouth.
Variety Mills	2.92	3.50	4.77	2.21	7.10	3.03	2.90	3.50	....	....	....	....	....	J. Howard Micklem.
Wytheville	3.25	2.61	2.73	1.35	8.73	1.30	1.83	3.67	12.20	5.05	2.20	2.30	42.22	Howard Shriver.
Washington Territory:														
Blakely	9.07	2.30	4.94	1.96	0.53	4.15	1.48	0.34	1.16	4.05	5.33	6.12	41.43	R. M. Hoskinson.
Canby, Fort	11.39	3.69	6.58	3.53	0.49	5.66	1.92	0.93	2.14	6.89	8.43	8.13	59.78	Signal Service.
Neah Bay	14.56	7.86	11.37	7.79	1.67	10.28	4.96	0.97	3.84	16.75	11.20	11.70	102.95	Do.
Olympia	11.38	2.71	5.96	1.72	0.21	4.80	1.36	0.30	1.67	4.27	6.05	5.11	45.54	Do.
Port Angeles	5.43	1.58	2.89	1.56	0.21	2.62	1.11	0.53	0.72	4.31	3.77	3.44	28.17	Do.
Pysht	11.75	....	10.55	4.94	0.59	6.66	2.54	0.45	2.64	9.44	7.31	5.51	....	Do.
Spokane Falls	3.96	0.64	0.62	0.39	1.24	5.12	0.06	0.07	0.03	1.57	1.08	2.91	17.69	Do.
Spokane, Fort	2.76	0.68	0.30	1.00	0.40	3.16	0.04	....	T	1.38	0.72	3.14	....	U. S. post hospital.
Tacoma	9.06	2.49	....	1.47	0.58	4.11	1.16	0.63	1.88	3.60	6.34	4.97	....	Edw. N. Fuller.
Tatoosh Island	12.10	5.42	8.45	5.92	1.63	7.44	8.44	1.10	3.52	12.12	10.76	11.82	83.72	Signal Service.
Townsend, Fort	3.05	1.03	2.45	1.69	0.61	3.41	4.41	0.42	0.36	2.65	1.48	....	....	U. S. post hospital.
Vashon Island	9.74	2.95	3.59	1.34	0.08	4.45	1.39	0.20	1.40	3.60	4.81	4.65	38.20	Mrs. C. B. Carpenter.
Walla Walla	2.21	0.80	1.44	0.69	0.21	2.37	0.46	0.00	0.02	2.33	0.87	2.19	13.59	Signal Service.
Walla Walla, Fort	0.30	0.32	0.21	0.54	0.06	0.92	0.42	....	0.02	2.22	0.46	1.42	....	U. S. post hospital.
West Virginia:														
Charleston	3.46	3.25	4.28	1.97	3.72	1.40	3.88	4.64	6.29	6.30	2.69	1.67	43.55	Signal Service.
Clarksburg	3.71	2.02	3.22	2.44	3.08	2.93	9.59	....	....	....	....	....	....	R. T. Lowndes.
Helvetia	4.32	2.79	4.38	2.61	5.85	2.81	6.28	4.67	2.77	8.14	2.97	3.05	50.64	Dr. C. F. Stucky.
Morgantown	6.85	2.34	3.77	2.39	5.82	3.73	7.29	8.70	5.03	7.14	4.90	1.92	59.88	Signal Service.
Parkersburgh (1)	....	....	....	....	....	....	10.33	6.71	5.19	4.95	4.13	1.62	....	Do.
Parkersburgh (2)	....	1.72	2.30	2.55	3.96	2.52	9.73	5.76	4.98	5.15	6.27	1.52	....	Theo. G. Field.
Rockport	....	....	....	....	....	....	....	5.76	5.10	....	4.19	1.64	....	R. D. J. Echols.

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Rowlesburgh	6.15	2.50	4.74	2.65	4.32	1.72	*1.20	*1.50	....	1.39	1.65	1.10	....	Signal Service.
Weston	4.92	2.54	4.21	4.03	4.46	3.49	2.65	3.90	....	4.02	1.71	1.99	....	Do.
Wheeling	4.88	1.81	2.80	1.28	4.77	1.97	9.68	7.29	3.18	4.28	4.78	2.59	49.31	Do.
White Sulphur Springs	....	....	....	....	3.35	3.70	1.67	4.01	6.31	6.02	1.54	1.83	....	T. Surber.
Wisconsin:														
Beloit	1.16	1.12	2.83	2.76	5.60	3.84	4.55	3.34	1.01	....	....	....	....	Beloit College Observatory.
Delavan	1.22	0.87	1.70	2.41	4.39	3.94	2.25	2.25	0.69	1.79	2.01	2.56	26.08	George L. Collie.
Denster	1.82	....	3.60	....	5.00	2.25	4.50	4.40	1.35	....	....	....	....	G. H. Kruschke.
Embarrass	3.55	2.10	3.55	3.25	6.30	3.25	3.30	4.35	6.15	2.20	2.65	3.20	43.85	J. E. Breed.
Fond du Lac	2.08	0.96	3.23	1.81	3.05	2.59	6.37	2.26	2.64	1.27	2.63	1.93	30.82	J. C. Wedge.
Green Bay	2.38	2.11	5.69	2.90	3.79	1.14	3.13	2.39	5.36	1.45	2.12	3.01	35.47	Signal Service.
La Crosse	1.44	0.61	4.12	3.29	6.20	3.62	4.55	5.93	1.66	1.12	0.28	2.03	34.85	Do.
Lancaster	2.50	1.20	1.85	3.05	5.05	7.00	2.91	1.60	1.59	....	....	....	....	Edw. Pollock.
Madison	1.54	1.01	2.61	1.85	3.76	2.95	2.26	1.27	1.04	1.63	1.32	1.57	22.86	Washburne Observatory.
Manitowoc	1.87	3.60	3.69	2.23	3.51	1.11	3.62	2.76	3.63	0.96	1.61	2.14	30.73	Miss Clasina Lüps.
Milwaukee	1.41	1.08	2.25	2.34	2.21	2.90	3.48	2.22	0.99	1.18	1.46	1.97	23.49	Signal Service.
Prairie du Chien	1.75	3.50	3.83	3.38	5.47	4.32	....	....	....	....	....	....	....	College of Sacred Heart.
Wyoming:														
Bridger, Fort (1)	0.53	0.53	1.66	0.75	1.91	0.26	0.94	1.10	....	....	....	....	....	Signal Service.
Bridger, Fort (2)	....	....	....	....	....	....	....	....	0.04	0.50	0.62	0.76	....	U. S. post hospital.
Cheyenne	0.29	0.72	2.04	0.94	3.74	0.56	2.31	1.15	1.66	0.30	0.59	0.21	14.51	Signal Service.
Laramie, Fort (1)	0.10	1.05	0.76	0.30	4.21	b0.09	b2.94	4.52	0.08	0.26	0.81	0.44	15.56	Signal Service.
Laramie, Fort (2)	0.02	0.08	0.52	0.12	2.46	0.03	1.30	1.31	0.02	0.02	0.08	....	....	U. S. post hospital.
McKinney, Fort (1)	0.15	0.50	1.02	0.73	6.82	2.14	2.89	3.51	T	0.05	0.23	0.29	18.33	Signal Service.
McKinney, Fort (2)	0.50	1.02	0.78	1.33	6.37	1.54	3.63	2.06	0.00	0.16	0.25	0.30	17.94	U. S. post hospital.
Sheridan, Camp	3.93	2.02	3.12	4.80	T	....	....	....	....	....	....	....	....	Do.
Washakie, Fort (1)	1.02	0.94	1.92	0.64	4.57	0.34	0.87	1.94	0.32	0.38	0.26	0.11	13.31	Signal Service.
Washakie, Fort (2)	0.14	0.27	0.69	0.51	4.70	0.48	1.04	2.06	0.36	0.44	0.75	0.20	11.64	U. S. post hospital.

*Incomplete.

APPENDIX 23.

Dates of the first and last killing frosts at stations of the Signal Service, U. S. Army, for the season of 1888–'89.

States and stations.	Dates of— First.	Dates of— Last.	States and stations.	Dates of— First.	Dates of— Last.
Alabama:			**Kentucky:**		
Mobile	Nov. 28	Feb. 7	Lexington	Sept. 24	Apr. 7
Montgomery	Nov. 26	Mar. 11	Louisville	Oct. 21	Apr. 6
Arizona:			**Louisiana:**		
Fort Grant	Nov. 8	Feb. 21	New Orleans	Dec. 20	Feb. 7
Whipple Barracks	Oct. 22	May 17	Shreveport	Nov. 10	Feb. 24
Yuma	(3)	(3)	**Maine:**		
Arkansas:			Eastport	Sept. 30	Apr. 23
Fort Smith	Nov. 10	Mar. 11	Portland	Sept. 7	Apr. 23
Little Rock	Nov. 28	Mar. 10	**Maryland:**		
California:			Baltimore	Oct. 22	Mar. 30
Bidwell, Fort	Oct. 18	(1)	**Massachusetts:**		
Eureka	Nov. 27	Feb. 19	Boston	Sept. 30	Apr. 8
Fresno	Nov. 7	Feb. 19	Nantucket	Oct. 1	Apr. 1
Keeler	Nov. 28	Feb. 20	Wood's Holl	Nov. 13	Mar. 31
Los Angeles	(2)	Jan. 20	**Michigan:**		
Red Bluff	(2)	Feb. 17	Alpena	Sept. 13	May 29
Sacramento	(2)	Feb. 18	Detroit	Sept. 29	May 28
San Diego	(3)	(3)	Grand Haven	Aug. 31	May 28
San Francisco	(2)	Feb. 19	Lansing	Oct. 9	May 28
Colorado:			Manistee	Oct. 6	May 29
Colorado Springs	Oct. 19	May 11	Marquette	Aug. 22	May 25
Denver	Oct. 8	May 17	Port Huron	Sept. 28	May 23
Montrose	Oct. 22	May 17	Sault de Ste. Marie	Sept. 5	May 25
Pike's Peak	(4)	(4)	**Minnesota:**		
Pueblo	Oct. 26	Apr. 30	Duluth	Oct. 14	May 28
Connecticut:			Moorhead	Sept. 12	May 30
New Haven	Sept. 30	Apr. 14	St. Paul	Sept. 29	Apr. 13
New London	Oct. 22	Mar. 31	St. Vincent	Aug. 17	May 30
Dakota:			**Mississippi:**		
Bismarck	Sept. 12	May 14	Vicksburg	Nov. 11	Mar. 4
Buford, Fort	Sept. 25	May 9	**Missouri:**		
Huron	Sept. 12	May 2	Kansas City	Oct. 20	Mar. 30
Rapid City	Oct. 2	May 15	Lamar	Oct. 7	(1)
Sully, Fort	Sept. 29	May 2	St. Louis	Nov. 11	Apr. 6
Totten, Fort	Aug. 17	(1)	Springfield	Oct. 3	May 3
Yankton	Oct. 2	May 3	**Montana:**		
District of Columbia:			Assiniboine, Fort	Oct. 12	May 15
Washington	Oct. 4	Apr. 6	Custer, Fort	Sept. 27	May 17
Florida:			Maginnis, Fort	Sept. 27	May 10
Cedar Keys	Dec. 21	(5)	Helena	Oct. 18	May 16
Jacksonville	Dec. 21	Feb. 8	Poplar River	Sept. 20	(1)
Jupiter	(3)	(3)	**Nebraska:**		
Key West	(3)	(3)	Crete	Sept. 30	(1)
Pensacola	Nov. 28	Feb. 7	North Platte	Sept. 29	May 2
Titusville	Dec. 21	(5)	Omaha	Oct. 3	Apr. 3
Georgia:			Valentine	Sept. 17	May 2
Atlanta	Nov. 24	Mar. 11	**Nevada:**		
Augusta	Nov. 12	Mar. 11	Carson City	Aug. 1	May 16
Savannah	Nov. 27	Feb. 22	Winnemucca	Oct. 14	May 8
Idaho:			**New Hampshire:**		
Boisé City	Oct. 20	Apr. 18	Manchester	Sept. 7	Apr. 23
Illinois:			**New Jersey:**		
Cairo	Oct. 3	Mar. 28	Atlantic City	Oct. 4	Mar. 30
Chicago	Oct. 8	Mar. 30	**New Mexico:**		
Springfield	Sept. 28	Apr. 6	Fort Stanton	Oct. 15	May 18
Indiana:			Santa Fé	Oct. 24	May 10
Indianapolis	Oct. 3	Apr. 7	**New York:**		
Indian Territory:			Albany	Oct. 11	Apr. 23
Sill, Fort	Oct. 3	Feb. 26	Buffalo	Oct. 10	May 29
Iowa:			New York City	Nov. 18	Mar. 15
Davenport	Oct. 3	Apr. 6	Oswego	Aug. 28	Apr. 29
Des Moines	Sept. 29	May 31	Rochester	Oct. 10	May 29
Dubuque	Sept. 28	Apr. 6	**North Carolina:**		
Keokuk	Sept. 29	Apr. 6	Charlotte	Nov. 11	Mar. 11
Kansas:			Hatteras	Dec. 14	Feb. 25
Concordia	Oct. 20	Mar. 30	Raleigh	Oct. 22	Apr. 6
Dodge City	Oct. 20	Mar. 28	Wilmington	Oct. 15	Feb. 26
Leavenworth	Oct. 3	Apr. 4	**Ohio:**		
Topeka	Sept. 28	(1)	Cincinnati	Sept. 30	Apr. 6
Wichita	Oct. 20	Mar. 28	Cleveland	Oct. 10	Apr. 14

Dates of the first and last killing frosts at stations of the Signal Service, etc.—Continued.

States and stations.	Dates of—	
	First.	Last.
Ohio—Continued.		
Columbus	Sept. 30	Apr. 14
Sandusky	Oct. 10	Apr. 7
Toledo	Oct. 3	May 28
Oregon:		
Portland	Nov. 14	Feb. 25
Roseburgh	Oct. 18	Mar. 19
Pennsylvania:		
Erie	Nov. 4	Apr. 15
Harrisburg	Oct. 4	Mar. 31
Philadelphia	Oct. 10	Mar. 31
Pittsburgh	Oct. 10	Apr. 6
Rhode Island:		
Block Island	Nov. 13	Apr. 7
South Carolina:		
Charleston	Dec. 15	Feb. 7
Columbia	Nov. 12	(1)
Tennessee:		
Chattanooga	Sept. 30	Mar. 11
Knoxville	Nov. 12	Apr. 6
Memphis	Nov. 11	Feb. 25
Nashville	Oct. 29	Mar. 29
Texas:		
Abilene	Nov. 20	Mar. 10
Brownsville	(3)	(3)
Corpus Christi	(3)	(3)
El Paso	Oct. 24	Mar. 24
Fort Davis	Nov. 9	(1)
Fort Elliott	Nov. 8	Mar. 21
Galveston	(3)	(3)
Texas—Continued.		
Palestine	Nov. 10	Feb. 24
Rio Grande City	(2)	Jan. 21
San Antonio	Nov. 9	Jan. 21
Utah:		
Fort Du Chesne	Oct. 6	May 8
Salt Lake City	Oct. 22	Apr. 19
Vermont:		
Northfield	Sept. 6	May 4
Virginia:		
Lynchburgh	Oct. 10	May 4
Norfolk	Nov. 28	Mar. 12
Washington:		
Canby, Fort	Nov. 14	Feb. 16
Olympia	Nov. 15	Apr. 19
Port Angeles	Oct. 30	Apr. 2
Spokane Falls	Oct. 18	Apr. 17
Tatoosh Island	(2)	Feb. 14
Walla Walla	Oct. 18	Mar. 1
West Virginia:		
Parkersburgh	Oct. 4	May 4
Wisconsin:		
Green Bay	Sept. 29	May 28
La Crosse	Sept. 29	May 22
Milwaukee	Sept. 29	Apr. 7
Wyoming:		
Cheyenne	Sept. 27	June 11
Fort McKinney	Oct. 14	May 17
Fort Washakie	Oct. 6	May 19

NOTES.

[1] Station closed before last frost was to be expected.
[2] No frost prior to January 1, 1889.
[3] No frost during the season.
[4] Frost every month during observations.
[5] No frost after January 1, 1889.

APPENDIX 24.

Date of closing and opening of navigation on the lakes and rivers at selected stations of the Signal Service for the winter of 1888–'89.

Stations.	Lakes or rivers.	Navigation.	
		Closing.	Opening
Dakota:			
Bismarck	Missouri River	Nov. 14	Mar. 21
Fort Buford	do	Oct. 19	Apr. 31
Fort Sully	do	Nov. 16	Apr. 18
Illinois:			
Cairo	Mississippi River	(2)	(2)
Chicago	Lake Michigan	Nov. 30	Mar. 26
Iowa:			
Davenport	Mississippi River	Jan. 9	Mar. 14
Dubuque	do	Dec. 21	Mar. 15
Keokuk	do	Dec. 18	Mar. 9
Kansas:			
Leavenworth	Missouri River	Feb. 24	Mar. 4
Kentucky:			
Louisville	Ohio River	(2)	(2)
Maryland:			
Baltimore	Patapsco River	(2)	(2)
Michigan:			
Alpena	Lake Huron	Dec. 20	Apr. 5
Detroit	Detroit River	Dec. 4	Apr. 1
Marquette	Lake Superior	Nov. 26	Apr. 21
Port Huron	Lake Huron	Dec. 11	Apr. 1
Minnesota:			
Duluth	Lake Superior	Dec. 2	Apr. 19
Moorehead	Red River	Nov. 15	Apr. 15
St. Paul	Mississippi River	Oct. 26	Apr. 6
Missouri:			
St. Louis	Mississippi River	(2)	(2)
Montana:			
Fort Custer	Big Horn River	Dec. 25	Apr. 26
Nebraska:			
Omaha	Missouri River	Jan. 18	Mar. 4
New York:			
Albany	Hudson River	Dec. 12	Mar. 19
Buffalo	Lake Erie	Dec. 6	Apr. 12
Oswego	Lake Ontario	Dec. 10	Apr. 4
Ohio:			
Cincinnati	Ohio River	(2)	(2)
Cleveland	Lake Erie	Dec. 8	Apr. 1
Sandusky	do	Dec. 8	Apr. 8
Toledo	do	Dec. 3	Apr. 14
Pennsylvania:			
Erie	Lake Erie	Dec. 5	Apr. 10
Pittsburgh	Ohio River	(1)	(1)
Tennessee:			
Chattanooga	Tennessee River	(2)	(2)
Nashville	Cumberland River	(2)	(2)
Wisconsin:			
La Crosse	Mississippi River	Dec. 21	Mar. 30
Milwaukee	Lake Michigan	(2)	(2)

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[1] Navigation impeded, but not wholly interrupted.

[2] Navigation not interrupted.

APPENDIX 25.

The following errors in Recent Advances in Meteorology, by Prof. William Ferrel, published in the Annual Report of the Chief Signal Officer, 1885, Appendix No. 71, have been noted:

Page 26, eq. (40), for "6364463^m" read "6634463^m."

Page 28, eq. (48), for "6604463^m" read "6634463^m."

Page 28, eq. 49) and the one immediately preceding, and also near the middle of the page, for "0.0000003" read "0.00000015."

Page 28, paragraph near the middle, for "0.51493" read "0.51703."

Also, for "Table VI" read "Table IV," and *vice versa.*

Page 37, table at bottom, for "419.56" read "415.56," and for "91.66" read "51.66."

Page 47, eq. (75) and (79), for "dQ" read "−dQ." Also, in equation following (79), in second number after first term, for − read +.

Page 52, line near the middle, for "less" read "greater."

Page 54, third line below table, put "for" before the word "depths."

Page 123, near the middle, for "*conducted*" read "*radiated and conducted.*"

Page 194, eq. (25), for "X_0-X" read "$X-X_0$."

Page 226, in three places, for "600 meters" read "750 meters."

Page 249, near bottom, in parentheses, for "cyclonic" read "anti-cyclonic," and *vice versa.*

Page 259, ninth line from top, for "November" read "March."

Page 276, paragraph 210, second line, after "temperature" read "gradient."

Page 292, paragraph 222, ninth line, after "initial" read "velocities."

Page 299, eq. (16) and (18), for "102.1" read "125."

Page 308, paragraph 235, for "§ 223" read "§ 172."

Page 324, seventh line from top, for "1863" read "1763."

Page 336, middle of page, for "0" read "θ."

Page 337, foot note, for "$5\ \theta''$" read "$s\ \theta''$."

Page 387, near the middle, in the expression of A omit the factor P.

Page 389, ninth line from bottom, for "A" read "H."

Page 389, eq. (19), for "$0.612 r_1 \log.\frac{r_1}{r_0}$" read "$6.12 r_1 \log.\frac{r_0}{r_1}$."

Page 285, instead of line just above paragraph 218 read "velocities corresponding to given gradients greater in summer than in winter." For the matter in italics in paragraph 218 read "*the mean velocity of the wind corresponding to each gradient is much higher in summer than in winter.*"

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